1992

Fabric hand as perceived by US and Korean males and females

Hyunsik Kim
Iowa State University

Order Number 9223939

Fabric hand as perceived by U.S. and Korean males and females

Kim, Hyunsik, Ph.D.

Iowa State University, 1992

U·M·I

300 N. Zeeb Rd.
Ann Arbor, MI 48106

Fabric hand as perceived by U. S. and Korean males and females

by

Hyunsik Kim

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Major: Textiles and Clothing

Approved:

Members of the Committee:

Signature was redacted for privacy.
In Charge of Major Work

Signature was redacted for privacy.
For the Major Department

Signature was redacted for privacy.

Signature was redacted for privacy.
For the Graduate College

Iowa State University
Ames, Iowa

1992

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I. INTRODUCTION

The concept of fabric hand is used to describe fabric quality and suitability for a specific end use. When a new product is introduced to the apparel or home furnishings market, one of the first quality assessments attempted is fabric hand.

Measurement of fabric hand includes objective measurement by laboratory tests and subjective measurement by human sensory assessment. Laboratory tests of fabric hand measure physical characteristics of textiles. However, human judgments of fabric hand provide more multi-dimensional understanding of fabric properties than do laboratory tests.

Traditionally, subjective assessment of fabric hand has been by male experts in the textile and clothing industries. Sensory evaluation of fabric hand by experts has shown fairly good agreement with objective measurements. However, researchers such as Brand (1964) and Wauer (1965) reported disagreement between responses of textile experts and those of consumers (naive judges). Winakor, Kim, and Wolins (1980) stated that expert judges could quantify the sensory qualities of products, whereas consumers were appropriately used to determine preferences for products. Therefore, hand preference for fabrics, an influential factor in a consumer's purchasing decision, can be best predicted by consumer judgment.

First, this research develops comparable sets of unipolar adjectives for consumer evaluation of fabric hand for the United States and Korea. International trade has been increasing in apparel and other textile products in recent years. Rabolt, Bothwell, Forney, and Barry (1988) indicated that communication between importing and exporting countries can present problems. Words (descriptors) are the most common medium for communicating the perception of fabric hand. Therefore, it has become important to standardize terminology used to communicate subjective fabric properties in terms of quality control among the countries.

Asian countries such as Hong Kong, Taiwan, and Korea are the major exporters of textiles and apparel to the United States (U. S. International Trade Commission, 1984). Techniques of hand assessment by consumers are more advanced in the United States than elsewhere: Asian countries are beginning to recognize that judgments by experts do not necessarily predict consumer preference. For example, no research was found on consumer preference in assessment of hand of selected fabrics in Korea.

Second, this research examines cultural differences between U. S. consumers and Korean consumers in their evaluations of and preferences for fabric hand. As mentioned, differences in experiences or training of individuals can affect evaluation of fabric hand. In addition, differences in language, climate, and culture among countries can affect evaluation of fabric hand. Yuan (1990) found that the senses and uses of "thin" were different in the English and Chinese languages. Fritz, Harwood, and Smith (*ca.* 1987) found that fabrics preferred for blouse or underslip end use in Scotland differed from those preferred in Australia for the same end uses. They concluded that cultural and climate influences contributed to the preferences of judges.

Problems in cross-cultural comparison of fabric hand may arise in selection of appropriate verbal descriptors. The semantic differential has been used to evaluate quality of fabric hand. Problems may occur when bipolar adjectives are not exact antonyms. Whisney, Winakor, and Wolins (1979) compared photographs of evening wear and drawings of the same styles as stimuli in measurement of fashion preference by using the semantic differential (polar adjectives). They observed that "dull" was not the opposite of "shiny." Some respondents in their research may have been thinking of "dull" as the opposite of "exciting" rather than as a descriptor of the appearance of fabrics. Also, word pairs that are antonyms in English may not be antonyms in another language. Therefore, unipolar scales rather than

bipolar scales may be preferable in cross-cultural comparisons of fabric hand to avoid the problem of matching antonyms in both languages.

Research on sex differences in responses to fabric hand raises a question. Bogaty, Hollies, and Harris (1956) and Anttila (1988) reported non-significant differences between males and females in responses to fabric hand. Bogaty et al. observed that men tend to judge harshness more severely on the average than women in evaluating fabric hand. Anttila found that men report higher values for weight, roughness, and softness of fabrics than women do. However, I found no research specifically designed to measure sex differences in assessment of fabric hand.

Males and females differ in their evaluation of affective stimuli in perceptions of comfort and of fashion risk (Hollies, Custer, Morin, & Howard, 1979; Kipp, 1980; Lubner-Rupert & Winakor, 1985). Hollies et al. and Kipp observed that women's panels showed greater sensitivity in responses to comfort. Winakor, Canton, and Wolins (1980) found responses of males to affective scales to be more homogeneous and less extreme than those of females. Lubner-Rupert and Winakor (1985) reported that although males and females arranged styles in the same order of preference when judging them for their own sex and the other sex, they used aesthetic word pairs differently to describe same-sex and other-sex garments. Because males and females seem to respond differently to affective scales, it is difficult to tell if they perceive stimuli differently. This dissertation examines sex differences in assessment of fabric hand and compares preferences of judges for fabrics for themselves and for members of the other sex, in the United States and Korea.

In summary, this dissertation develops sets of unipolar descriptors for specific fabrics and examines how males and females in the United States and Korea use these descriptors. This research also examines preferences for hand for the judge's own sex and for the other sex. In the task, naive judges in the U. S. and Korean universities responded to sets of

unipolar adjectives with an 11-point scale. Stimuli are selected as possible shirting fabrics for U. S. and Korean consumers. Judges can see and touch fabrics simultaneously. All phases of this research received approval from the Committee on The Use of Human Subjects in Research.

Objectives

The objectives of this research are:

1. To develop comparable sets of unipolar adjectives for consumer evaluation of fabric hand for the United States and Korea;
2. To examine cultural differences in evaluation of fabric hand between U. S. consumers and Korean consumers;
3. To compare use of descriptors for fabric hand by sex;
4. To compare preferences of judges for fabrics for a specific end use for the judge's own sex and for the other sex in the United States and Korea;
5. To develop hypotheses concerning factors that influence preferences for fabric hand in the United States and Korea.

Definitions

Fabric hand: "tactile and muscular (kinesthetic) sensations produced by a fabric" (Lundgren, 1969, p. 1).

Tactile: perceptible to the sense of touch, by squeezing, rubbing or otherwise handling.

Visual: perceptible to the sense of sight.

Limitations

Limitations of this research are:

1. Respondents are limited to female and male students at Iowa State University in the United States and at Seoul National University in Korea.
2. Fabrics are limited to seven sets of woven fabrics. All fabrics are white.
3. Fabrics used for this research are limited to a specific end use such as a shirt.
4. Preferences of judges for fabrics for the judge's own sex and for the other sex are limited to shirt end use.

CHAPTER II. REVIEW OF LITERATURE

This chapter reviews literature relevant to the psychophysical versus the psychological approach to sensory evaluation and the measurement of fabric hand. The major part of the theoretical background of the research lies in the role of psychological measurement in human sensory evaluation. The section on the psychological approach to sensory evaluation discusses the following topics: 1) the type and number of judges, 2) sex of judges, 3) preferences for fabric hand, 4) cultural differences among judges, 5) bipolar adjectives versus unipolar adjectives, 6) scaling of responses, and 7) seeing and touching textile stimuli versus touching only. These sections will review some themes, problems, and methodological concerns of fabric hand research. The last section reviews international trade in textiles and apparel between the United States and Korea.

The Psychophysical versus the Psychological Approach to Sensory Evaluation

The psychophysical approach to sensory evaluation

Stevens (1958) outlined the problems and methods of psychophysics which have become the basis for assessment of human responses to physical stimuli. He stated that psychophysics is the functional relationship between stimulus and response. This function is affected by numerous parameters. The methods of psychophysics were generally designed to measure the numerical values of stimuli which are objective and reliable; mechanical or electronic apparatus and human beings can be used as instruments in this objective measurement. Stevens (1958) claimed that human beings' sensing surpasses in flexibility and power any inanimate substitutes yet devised. He also stated that mechanical instruments may aid but do not displace the wine taster, the leather grader, and the lumber sorter. Therefore,

although numerical values of stimuli can be obtained using mechanical instruments, these values alone cannot replace human responses to stimuli.

In psychophysical measurement, the judges are given specific training in the use of psychophysical techniques. They are tested for reliability and only those who give reliable results are selected. If trained judges are very objective and reliable, responses of trained judges can be compared with numerical values as measured by mechanical instruments and can substitute for those values without measurement by mechanical equipment. For example, laboratory equipment can measure concentration of sugar in orange juice. However, using trained judges, food researchers can measure the sensation of sweetness in the taste of orange juice. In general, psychophysics has provided the theoretical foundation for research in the sensory realm such as food taste and odor.

Psychophysics is also applied in the apparel and textile field. For many years, textile researchers have been researching the relationship between sensory hand properties and physical properties of textile fabrics as measured by laboratory instruments. This research assumes that the hand is the result of the mechanical properties of the fabric and can be completely expressed by the mechanical property values of the fabric (Howorth & Oliver, 1958; Kawabata & Niwa, 1975).

Kawabata (1984) suggested that experts, mostly from the industries of wool fabric weaving and finishing, could be used to measure and quantify fabric handle. The judges were "experts" -- professional or experienced persons in the textile industry -- but it was not clear if they had been trained in judging. The results obtained with the experts' evaluations were compared with the values obtained using mechanical instruments for measurement of fabric qualities. Therefore, objective measurements using mechanical equipment on tensile, bending, surface, shearing, and compressional properties, and weight were correlated with such primary

hand expressions as stiffness, smoothness, fullness, softness, and crispness as measured by a panel of experts (Kawabata & Niwa, 1975).

Sweeney and Branson (1990) measured the threshold of moisture sensation of fabric using the psychophysical approach. They found a linear relationship between moisture magnitude and moisture sensation. However, in psychophysical measurement, the responses of human beings to stimuli are not always linear. In summary, the psychophysical approach examines the relationship between stimuli in the physical domain and sensation in the psychological domain.

Generally fabric hand is defined as a subjective property judged by people (Schwarz, 1939) or "the impressions which arise when fabrics are touched, squeezed, rubbed, or otherwise handled" (Hoffman & Beste, 1951). These authors use the word "subjective" more in the sense of psychophysical measurement than of psychological measurement. Sensory impressions may result from tactile surface properties of the static fabric against the skin or from small muscle sensation from movement of the fingers or other parts of the body relative to the fabric. For example, the physical stimulus of fabric is described in the following ways: stiffness by kinetic movement or bending of fabric, softness by either kinetic movement or tactile surface of fabric, and smoothness by tactile surface of fabric. When human beings evaluate fabric hand, they feel overall fabric hand, not just a single property of fabric hand. Therefore, human responses to fabric hand are affected by interaction among these properties of fabric or interaction of different ways of touching. In the psychophysical approach to fabric hand, trained judges would be able to differentiate among these interactions in measurement.

Kim and Vaughn (1979) predicted fabric hand from mechanical properties of woven fabrics. They listed seven hand properties: bending, draping, shearing; tensile, compressional, and frictional properties; and area density. They suggested that these hand properties can be predicted by physical parameters measured by test equipment. For example, bending

properties can be predicted by the five physical parameters: elastic flexural rigidity, coercive couple, single curvature bending rigidity, multicurvature bending rigidity, and bending recovery. They found the relationship between the physical parameters and the average of subjective panel assessment. Therefore, they concluded that fabric hand can be expressed in purely mechanical terms by measuring the component physical hand parameters and assigning a numerical hand value to a fabric. However, they did not specify whether the judges were trained or not.

Although many researchers have used the psychophysical approach to measurement of fabric hand, the philosophy differs among them. Kawabata (1984) and Sweeney and Branson (1990) followed Stevens' approach that human beings' measurements of stimuli are more complete than the measurements by mechanical equipment. However, Kim and Vaughn (1979) used an opposite approach to the measurement of stimuli. They wanted to predict hand properties by the physical parameters as measured by mechanical equipment.

The psychological approach to sensory evaluation

According to the psychological approach to sensory evaluation, the results obtained by naive judges (consumers) cannot be compared with the measurements by equipment or trained judges. The psychological approach measures subjective evaluation of stimuli. Psychological evaluation is an affective impression experienced by naive judges. Naive judges can measure perception of stimuli and preferences for stimuli. Therefore, psychological measurement using consumers can predict consumer responses or preferences for stimuli (Winakor, Kim, & Wolins, 1980).

As mentioned, some researchers defined fabric hand as a subjective property evaluated by people (Brand, 1964; Schwarz, 1939). Bogaty et al. (1956) used polar adjectives to evaluate subjective hand of harshness using a numerical scale ranging from 1 (very soft) to 6

(very harsh). However, the panel included both expert and naive judges. The researchers concluded that, "The evaluation of fabrics offered one at a time for judgment on an arbitrarily defined scale was found to be as efficient in discrimination as the more usual comparison with another fabric as a reference standard" (p. 360). They also suggested that replication of the observations of judges is useful in minimizing errors in judgment.

An affective approach for evaluating consumer preference was used by Winakor and Goings (1973) and Whisney et al. (1979). Whisney et al. compared judges' subjective responses to garment styles shown in two modes, photographs and drawings, as stimuli in measuring fashion preference. Preference for stimuli is a different, complex area because preferences are related to the total feeling of social-psychological and physical aspects and past experiences of an individual.

Evaluation of preference for stimuli may need to be in a context. According to Paek (1978), the assessment of fabric hand is influenced by three variables: products, evaluators, and end-uses. Many researchers evaluated preferences for clothing style or hand of fabric for specific end-uses. Whisney et al. (1979) asked respondents' preferences for evening wear using drawings and photographs. Kim and Piromthamsiri (1984) and Paek (1978) evaluated flame-retardant sleepwear fabrics for preferences for fabric hand.

The Measurement of Fabric Hand

The type and number of judges

Several researchers commented on differences in assessment of textile hand by expert and naive judges (Brand, 1964; Wauer, 1965). Brand mentioned that words have been used to describe textile properties. He also suggested that most people could not understand many words such as hungry, bite, and lively which were commonly used in the textile field. Wauer

observed that consumer descriptions of weave or method of construction, fiber content, fabric name, and weight were consistently different from those of home economists. She suggested that persons in these two groups might have difficulty understanding one another when attempting to communicate about fabrics. Paek (1978) reported that hand preference differed among judging groups such as students, homemakers, and a trained panel.

Winakor, Kim, and Wolins (1980) mentioned that expert judges could quantify the sensory qualities of products, whereas consumers were appropriately used to determine preferences for products. Probably they were thinking of judges trained to apply psychophysical techniques. They stated that college students who were taking a textiles course, although not completely naive, were probably more like consumers than like textile experts in their experience.

Consumer descriptions of fabric hand for a specific end use can be compared to sensory evaluations and physical properties of fabric hand to predict consumer preferences. However, several researchers have misused expert judges to determine consumer preference for fabric hand. For example, Lundgren (1969) evaluated fabric hand as a linear function of subjective hand properties and objective measurements and used a trained panel to determine consumer preferences. Stearn, D'Arcy, Postle, and Mahar (1985) examined the fabric handle preferences of panels of expert judges drawn from five countries. Also Mahar and Postle (1984) determined the fabric handle preferences for winter weight fabrics by using panels of expert judges drawn from four national groups. Winakor, Kim, and Wolins (1980) stated that "an expert judge can say how soft a fabric is, but only consumers can say how soft they like it to be for a particular end-use" (p. 602). Therefore, it is inappropriate to use expert judges to measure consumer preferences.

Winakor, Kim, and Wolins (1980) observed that the number of consumer panelists depended on the statistical analyses to be used. They said that simple statistical measures such

as Student's t and the correlation coefficient r stabilize at sample sizes of around 25-30 persons, so this establishes a minimum panel size. However, larger samples may be required for analysis of variance and very large sample sizes (200 or more) for factor analysis and other complex techniques.

Sex of judges

This discussion concerns consumer judges. No research was found that examined differences in assessment by trained female judges and trained male judges. Research has shown that males and females differ in their responses to affective stimuli. In responses to perceived fashion risk and fashion preferences for clothing, some researchers reported sex differences when males and females evaluated affective stimuli. Winakor, Canton, and Wolins (1980) used verbal statements and a 99-point certainty scale to measure male and female perceptions of fashion risk relative to self-esteem. Response patterns of males and females differed: males were more homogeneous in their answers and less extreme in their responses. Therefore, they conducted factor analysis for males and females separately and found that factor structures were different for males and females.

Lubner-Rupert and Winakor (1985) used a 99-point certainty scale to examine male and female style preference and perceived fashion risk. They found that when judging men's suits using a full forced-choice paired comparison, females had a wider range of mean preference scores than males did. However, there appeared to be no significant difference between males and females. The standard deviations of responses to the polar adjectives showed that males varied more in their responses than did women. This suggests that a larger panel size is needed for males than for females. This result seems to differ from responses of males and females to fashion risk and self-esteem.

In sensory evaluation of human thermal comfort, Kipp (1980) reported that responses to environmental comfort showed a greater sensitivity among female college students than among males in a field study. Hollies et al. (1979) examined men's and women's perceptions of clothing comfort in a laboratory when subjects were wearing jeans. They observed a greater sensitivity to clothing comfort perception in women's panels. Because of the greater sensitivity of women, smaller panel sizes could be used for females than males.

However, in fabric hand research, there is little clear evidence that males and females differ in subjective responses to stimuli on fabric hand. Bogaty et al. (1956), using expert and naive judges, observed that men tended to judge harshness more severely on the average than women in evaluating fabric hand. But there was no significant difference. Also, Anttila (1988) reported that there were differences in the results between males and females in the evaluation of resilience versus creasability and in that of warmth versus coolness by various judges. She explained the differences by "heavy handedness" which could account for the higher values assigned by the men to weight, roughness, and softness. However, she found no consistent difference in responses of men and women to fabric hand.

Although socio-psychological differences such as sexual attitudes or socialization to sex-role stereotype could affect responses to fabric hand, a question can be raised in evaluation of stimuli by male and female judges. It is hard to differentiate whether the differences by sex of judges come from the differences in preferences or in using scales of an instrument.

Preferences for fabric hand

Some researchers investigated perceived fashion preferences of females by using various stimuli such as line drawings of skirt length and silhouette, photographs and drawings of evening dress, or line drawings of various female dresses with applied achromatic values (Whisney et al.,1979; Winakor & Goings, 1973; Winakor & Navarro, 1987). Winakor and

Goings (1973) studied line drawings of skirt length and silhouette. In their research, the relationship between fashion preferences and actual behavior was inconclusive because respondents may not have associated line drawings used as stimuli in the fashion instrument with actual garments in their wardrobes. Therefore, Whisney et al. (1979) examined preferences for photographs and drawings of evening dresses. Winakor and Navarro (1987) examined the relationship between achromatic value and preferences for specific garment styles.

Goings (1971) mentioned preference, buying, and use cycles for a fashion item. According to her, preference precedes buying, which precedes use. Determining preferences for certain fashion products or materials is useful for textiles and apparel manufacturers because the manufacturers would have guidelines to use in selecting styles or materials which would be acceptable to consumers.

Using men's suits and women's dresses as stimuli, Lubner-Rupert and Winakor (1985) measured male and female fashion preferences for both same-sex and other-sex garments. They found that the range of mean preference scores was greater for females viewing men's suits than for males viewing men's suits. However, the range of mean preference scores for both sexes judging dresses was similar. Females might be more certain than males of their preferences for men's suits. The responses to the semantic differential indicated that standard deviations of both male and female responses were smaller when respondents were responding to own-sex clothing than when responding to other-sex clothing. However, when subjects were responding to other-sex clothing, female standard deviations tended to be smaller than male standard deviations. These results may differ if different stimuli are used.

Paek (1982) mentioned that women accepted manufactured fibers for underwear and sleepwear, whereas men usually wore cotton underwear and T-shirts. Using female

respondents, Paek investigated consumer preference for fabrics that are worn in contact with the skin. She reported that polyester/cotton blend fabrics were accepted for their blouses or shirts.

Using female respondents, Kim and Piromthamsiri (1984) investigated preferences for hand of children's sleepwear fabrics. They found that fiber contents were more important than fabric construction types in preference assessments.

Cultural differences among judges

Using the psychophysical technique, researchers mentioned cultural effects in assessing hands of fabric. Behery (1986) compared fabric hand assessment in reference to standard fabrics using expert judges from the United States and Japan. He found that there was difference in the assessment of fabric hand in the United States and Japan even among expert judges.

Mahar and Postle (1984) suggested that the separate specification of fabric hand on a national basis was necessary because there were subtle differences in hand preferences (expressions) among the various national expert panels in an experiment using Kawabata's system (1984). Some researchers confused cultural differences with types of judges in cross-cultural comparison of fabric hand. Fritz (1987) reported that cultural discrepancies between Japanese experts and Australian consumers include the inability to conceptualize *kishimi* (scroop) and difficulty in differentiating between the two kinds of stiffness, *koshi* and *hari*. Also, Fritz stated that Australian consumers generally dislike crispness (*shari*) in the fabric presented.

Using the psychological technique to assess fabric hand, Fritz et al. (*ca.* 1987) reported that Scottish and Australian judges differed in preference for fabrics for specific end uses such as blouses or underslips. They emphasized that certain fabrics highlight cultural and climate

influences as contributing to the preferences of judges. For instance, they stated that Australian judges chose lightweight cotton, dull styled crepe de chine, and soft, sensuous, or transparent fabrics for the end uses. On the other hand, the Scottish judges found the heavier shirtings, shiny, and synthetic style fabrics more acceptable. Although Anttila (1988) did not compare judges from different cultures, she stated that judges' previous experiences and the resulting conceptions are evidently decisive factors in the cognitive psychology theory of a sensory evaluation of textile materials. Moreover, she reported that the psychophysical response to textile materials was composed of emotional, physical, social, and sensory inputs from all senses; sight, hearing, smell, and even taste as well as touch, whenever a tactile evaluation of a piece of cloth was made. However, she probably meant the psychological response.

Differences of climate such as temperature or humidity among countries can affect respondents' preferences for fabric hand. Steam et al. (1985) mentioned that there were strong cultural determinants of fabric hand preferences over and above differences in climate. In addition, popular fabrics in a country could affect consumer judgments of hand.

Words are the most common instruments used to express hands of fabric in affective measurement. Therefore, language differences among countries could affect assessment of hand of fabric. Rabolt et al. (1988) indicated that communication among international trading countries always has the potential for being a problem area, such as differences in meaning across cultures. Although much research has been done to compare differences in perceived fabric hand among countries, previous researchers neither mentioned how they translated a language to another foreign language, nor compared the differences in description of fabric hand between countries. When one language is translated into another language, the problem of differences in meaning of a specific word between languages exists.

Bipolar adjectives versus unipolar adjectives

Bipolar adjectives Osgood, Suci, and Tannenbaum (1957) described the semantic differential technique as "a very general way of getting at a certain type of information, a highly generalizable technique of measurement" (p. 76). The three components of the semantic differential are a concept to be measured, a set of bipolar adjectives to describe the concept, and a 7-point scale for recording judgments. They also mentioned that people could come up with a few descriptive adjectives in response to an open-ended question, but when given the semantic differential they could make a large number of judgments quickly and confidently.

Many researchers have used bipolar adjectives to describe concepts in subjective assessment of a variety of stimuli including thermal environments and clothing comfort (Winakor, 1982), tactile qualities of fabrics (Winakor, Kim, & Wolins, 1980), and photographs and drawings of clothing styles (Lubner-Rupert & Winakor, 1985; Whisney, Winakor, & Wolins, 1979). However, none of these researchers did use the 7-point scale. Therefore, bipolar adjectives became a common technique in subjective assessment of stimuli.

Bogaty et al. (1956) mentioned subjective descriptions of fabric hand in comparison with organoleptic testing in industries (paint, food, beverage, and packaging) where subjective judgments of sensory qualities of odor or flavor are used for production control. They used polar adjectives and forced-choice paired comparison to judge harshness. They showed that polar adjectives could replace the forced-choice paired comparison for quantifying qualities of textile hand. Kim and Piromthamsiri (1984) used bipolar adjectives to evaluate flame-retardant sleepwear fabrics and the forced-choice paired comparison to determine preferences for the fabrics.

Unipolar adjectives Yuan (1990) examined semantic transferability and prototypicality in Chinese and English using "thin." She found differences in using "thin" between the two languages. The most central or prototypical sense of "thin" in English is found to be "she is thin" (describing a human body), while the most central or prototypical sense of the Chinese word "xi" is "a thin rope." In Chinese, "xi" refers only to long, narrow, and fine objects. A problem could be raised in using polar adjectives. Two words, one in one language, one in another language, which can be synonyms on the surface, may not mean exactly the same thing.

In comparison of photographs of evening wear and drawings of the same style, Whisney et al. (1979) observed that either "shiny" or "exciting" could be the opposite of "dull." Another problem in selecting bipolar adjectives is that not every adjective has a good antonym. In a cross-cultural comparison of fabric hand, word pairs that are antonyms in one language may not be antonyms in another language. Therefore, unipolar scales rather than bipolar scales may be preferable in cross-cultural comparison of fabric hand.

Hollies et al. (1979) used unipolar adjectives to measure clothing comfort. However, the most researchers have used bipolar rather than unipolar adjectives in fabric hand research.

Research on descriptors Another issue is how to obtain descriptors related to hand of fabric. From various sources, Brand (1964) collected 80 polar words which were most often used in describing fabric aesthetics. Some researchers searched out descriptors related to hand of fabric by using literature reviews. Vaughn and Kim (1973) listed 109 terms used as unique descriptors of hand based on literature reviews.

Words used to describe the characteristics of fabric hand may be provided by researchers or offered in free response by judges. Although terms or words offered by

researchers could help to describe human responses to fabric hand, these may limit people's ability to express their own opinions.

Alexander, Alexander, and Tzeng (1978) collected freely offered subjective descriptions by consumers responding to slides of chairs. From the free responses, a semantic differential instrument was then designed to describe chairs.

Wauer (1965) used the tape recorder to record spoken words describing fabric stimuli. Chang (1986) elicited written fabric hand descriptions from 40 undergraduate female students. She compared her findings with those reported by other researchers with regard to judges' ability to recognize words provided versus their ability to name words in free responses by writing. She also suggested that there could be differences between descriptors offered by subjects when writing and speaking because speaking may elicit words more freely than writing. Hyun, Hollies, and Spivak (1991) collected written descriptors about sensations and perceptions when subjects wore sleeves in a hot environmental chamber.

Scaling of responses

Many kinds of scales are used in human assessment of stimuli: yes-no (1-0) scales, three, four, five, seven, nine, eleven, and 99-point scales. The original semantic differential has a 7-point scale. In general, an odd number of responses is preferred to allow for a "middle" response, whatever that may be interpreted to mean.

Winakor and Goings (1973) used a 9-point scale in research on fashion preferences of consumers. Winakor (1982) used an 11-point scale to measure human comfort in indoor environments. Whisney et al. (1979) and Lubner-Rupert and Winakor (1985) used a 99-point scale in their research on fashion. They found that moderately well-educated persons could respond rapidly and reliably to the 99-point certainty scale.

In research on fabric hand, Winakor, Kim, and Wolins (1980) and Kim and Piromthamsiri (1984) used a 99-point scale. Winakor, Kim, and Wolins (1980) suggested that the 99-point certainty scale functioned well in the subjective hand assessment of the selected test fabrics. They reported that the advantage of the 99-point scale was the fine gradations and large amount of information provided.

Many kinds of scales have been used to evaluate fabric hand using polar adjectives. However, so far as is known, the 11-point scale has not been used to evaluate fabric hand using consumers as judges.

Warren, Klonglan, and Sabri (1969) evaluated various scales and they concluded that the 11-point scale gave very large amount of information and was easier for people to understand than longer scales. They also showed how data can be transformed to normalized ranks in analysis based on the Biometrika Tables for Statisticians by Pearson and Hartley (1954). The purpose of transformation is it that spreads apart the extreme ends of the scale and compresses responses near the middle because psychologists have observed that, in the subject's mind, the distance between two numbers near the middle of the scale is smaller than the distance between two numbers near the end of the scale (Winakor, 1982). According to Warren et al., transformed scales seemed to function better than original scales did and produced clear results. Winakor, Kim, and Wolins (1980) stated that a 9-point scale is the minimum number of intervals that can meaningfully be used in sensory assessment of textile hand because a scale with fewer than nine intervals cannot be transformed to normalized ranks. But several researchers did not mention the transformation of data in analysis. For instance, Hollies et al. (1979) did not transform their 9-point scale to normalized ranks in their clothing perception analysis.

Seeing and touching textile stimuli versus touching only

In several experiments, respondents touched fabrics but did not see them (Kim & Piromthamsiri, 1984; Lundgren, 1969; Winakor, Kim, & Wolins, 1980). Elder (1977) indicated that consumers use both appearance and handle to judge the quality of a fabric. He stated that appearance is governed by fiber content, construction of the fabric, and type of finish.

To rank the characteristic of bulk, Brown (1969) divided respondents into three groups: the tactile group, the visual group, and the tactivisual group. He found that the tactivisual group seemed to be more affected by the visual aspect than the tactile aspect.

Paek (1985) also used a touch only group and a touch and sight group in the actual preferential process by consumers to evaluate fabric tactual quality. The first time, respondents evaluated the fabrics by touch only. Then, they could see and handle the fabrics simultaneously at least a week after the first evaluation. She reported that the effect of vision on the perception of textiles was nonsignificant.

Chang (1986) divided subjects into handle only treatments and see and handle treatments to elicit hand descriptions. She found that seeing the fabrics seemed not to influence judges' responses when they assessed fabric hand. The time period between handle only and see and handle simultaneously was several minutes, which might not be enough for judges to forget the impressions of the previous test fabrics or for them to think about other words to use to describe these fabrics. Therefore, she suggested that different results might be obtained by extending the waiting time between treatments (handle only and see and handle).

International Trade in Textiles and Apparel Between the U. S. and Korea

Imported textiles and apparel from low-wage, developing countries such as Hong Kong, Taiwan, Republic of Korea, and China have increased their share of U. S. textile and apparel sales in recent years. According to a 1983 report by the Organization for Economic Cooperation and Development (cited in Cline, 1990), the United States received about a 67 percent share of developing country exports of apparel products in 1983.

According to a 1984 report by the Organization for Economic Cooperation and Development, the Republic of Korea exported 312 million dollars worth of textiles and 2.447 billion dollars worth of apparel to the United States in 1984 (cited in Cline, 1990). Therefore, the Republic of Korea was the third largest exporting country in apparel (17.1% in share of total import value) and the fourth largest export country in textiles (7.5% in share of total import value) to the United States (Cline, 1990). In addition, Korean manufacturers were increasing the quality and prices of their products for export. According to Sternquist and Davis (1986), the shift from lower price imports to middle and upper price imports was encouraged by trade restrictions that limited imports based upon the volume of goods imported rather than the dollar value of these goods.

Increased imports of textiles and apparel into the United States have caused many problems. For example, in 1983 textile plants in the United States were running at less than 70 percent capacity and unemployment in textiles was over 15 percent (Gatty, 1983). The rate of bankruptcies in the apparel industry was high. Also, for apparel alone, unemployment in the first half of 1980 averaged 10.8 percent compared to about 7.9 percent for all manufacturing (U. S. Senate, 1989). However, in the debate over whether apparel imports should be restricted, differing views were presented in the literature as to what was most advantageous to consumers.

The trade in textiles and apparel is largely one way between the U. S. and Korea. U. S. retailers and apparel manufacturers order textile and apparel products from the Republic of Korea. Rabolt et al. (1988) examined quality control problems in overseas apparel manufacturing. They reported that the causes of problems could be the following: not following specifications, production method, management, facilities or equipment, skills of workers, government or resource availability, and culture. In addition, they commented that language differences among countries affected quality control problems.

Summary

The "feel" or handle of a fabric is an important concept in studying the characteristics of textile materials. Fabric hand, a way of describing the "feel" of a fabric, has been used to evaluate fabric quality and suitability for a specific end use. Fabric hand may be evaluated by mechanical apparatus and by human judges using the psychophysical or the psychological technique. The psychological approach is the most appropriate technique for affective or subjective measurement of textile hand, including preference.

In measurement of affective aspects of textile hand, one issue is the type and number of judges used. The psychological approach uses consumer judges because sensory evaluation of fabric hand by consumers gives information about their perceptions and preferences for fabrics for specific end uses. The number of judges for evaluation of fabric hand depends on the statistical analysis to be used.

In using the psychological technique, various researchers have found differences between males and females as judges depending on what the task is. In textile hand, there is no clear evidence that males and females differ in subjective responses to stimuli on fabric hand.

Cultural differences among judges of textile hand have also been examined. Sometimes, researchers have mixed psychophysical and psychological techniques. In addition, none of the research, so far as is known, has dealt with the issue of difference in language. Usually textile hand has been measured with bipolar adjectives. However, research has shown that there are problems using bipolar adjectives even in the same language; sometimes one word in polar adjectives was not the opposite of the other word, or the word had two antonyms with quite different meanings. Two words in two different languages, which may be synonyms on the surface, may not mean exactly the same thing.

Research Hypotheses

Therefore, as a result of the review of literature, three hypotheses were developed for this research.

The hypotheses are:

1. U. S. and Korean consumers do not differ in their responses to fabric hand.
2. Male and female consumers do not differ in their responses to fabric hand.
3. For a specific end use, consumers prefer the same fabrics for members of their own sex as they prefer for the other sex.

CHAPTER III. PROCEDURE

In accordance with the purposes of this research, both qualitative and quantitative approaches were selected to achieve understanding of perceived textile hand by U. S. and Korean males and females and to test hypotheses developed from review of the literature. The focus group interview was chosen as the primary method of eliciting descriptors of textile hand for U. S. and Korean consumers and for investigating cultural and sex differences between the U. S. and Korean consumers. Hypotheses concerning cultural and sex differences were tested using quantitative data and statistical analysis.

The procedure for this research includes the following four phases: focus group interview, word list development, trial, and final data collection. All instruments for these procedures were in English for native English speakers and in Korean for native Korean speakers. Instruments were administered separately to U. S. and Korean groups. In a few cases males and females were mixed in groups.

Focus Group Interviews

Focus group interviews were designed to collect hand descriptors of fabrics and to examine gender differences and cultural differences among natives of Korea and of the U. S. One focus group was a trial with graduate students in the Textiles and Clothing Department at Iowa State University. The remaining four groups comprised Korean males and females and U. S. males and females enrolled at Iowa State University in 1990.

What are focus groups?

A focus group is a "carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment" (Krueger, 1988, p. 18). It is a qualitative method for collecting information on a given topic through simultaneous discussion by a group of respondents under the guidance of a moderator. Focus group interviews rely on interaction between the members of the group to elicit a range of insights that would be difficult to obtain using other methods.

Instrument

Three instruments were used in focus group interviews (see Appendix A): free response sheets, a general information sheet, and oral discussion questions. Five copies of the free response sheet were provided for each respondent to use to describe, in writing, the hand of each of five fabrics. The information sheet described the background of each judge, including year in school, age, sex, and major field of study. In oral discussion, eight questions were presented to respondents:

1) When you select clothing and textiles in the store, what kind of fabric hand do you prefer?
2) How would you describe these fabrics?
3) Tell me about texture for these fabrics.
4) How would you describe bending characteristics for these fabrics?
5) What about comfort characteristics for these fabrics?
6) How would you describe the compressibility for these fabrics?
7) What about strength for these fabrics?
8) How would you describe the visual characteristics of these fabrics?

These questions were asked orally and were shown in poster form.

Based on the trial group interview with textiles and clothing graduate students, some modifications in procedure were made for the next four group interviews. For example, textiles and clothing graduate students did not understand terms such as compressibility and bending. Therefore, explanations of these terms were added for the remaining group interviews. The researcher developed probing skills during the trial interview.

Stimuli

Fabrics chosen for this group discussion were selected for variety and familiarity to consumers so that respondents would be able to give diverse and clear descriptions of them by using their own vocabularies. All fabrics were purchased from local retail stores in Ames and Des Moines, Iowa during June, 1990. All fabrics were of woven construction. Each fabric was cut into swatches 44x44 cm in size. Although white fabrics were selected to avoid possible effects of color, the fabrics were variations of white. However, color of white for swatches was differed. A new set of five swatches was used for each focus group to avoid soil and wrinkling. Table 1 shows the characteristics of fabrics.

Table 1. Description of fabrics for the focus group interviews

Fabric	Fiber content	Symbol	Description
Flannel	100% cotton	A	Plain weave, napped finish
Organdy	100% polyester	B	Plain weave
Satin	100% polyester	C	Satin weave
Pique	100% cotton	D	Combination of plain and twill
Denim	100% cotton	E	Twill weave

Judges

Participants were 27 Iowa State University students. Participation in group interviews was voluntary. Volunteers were recruited in classes or by word of mouth through contact with friends. A sign-up sheet was passed during class time in selected classes in the College of Family and Consumer Sciences to get names and addresses of students. Table 2 shows the demographic characteristics of respondents.

Table 2. Demographic characteristics of respondents for the focus group interviews

Group	U. S.	Korean		U. S.	
	T & C (n)	Female(n)	Male(n)	Female(n)	Male(n)
Date of session	6/14	6/19	6/20	7/12	9/20
Number	4	5	4	7	7
Year in school					
Under-graduate	-	1	4	1	7
Graduate	4	4	-	6	-
Age					
18-21	-	1	1	-	4
22 or older	4	4	3	7	3
College					
Design	-	1	-	-	1
Education	-	-	-	3	-
Engineering	-	1	1	-	2
Family & Consumer Sciences	4	2	-	1	4
Science & Humanities	-	1	3	3	-

Administration

An invitation letter was sent to each participants one week before the session and a follow-up reminder letter or telephone call was made to him or her one day before the session. One assistant participated in each focus group interview to help the moderator; a Korean assistant for Korean group interviews and an American assistant for U. S. group interviews. Korean groups discussed topics in Korean and U. S. groups did so in English.

All fabric swatches were presented to respondents at one time and they freely saw and touched each fabric. As they handled each fabric, respondents wrote down words describing each fabric as completely as they could. Then they filled out the background questionnaire. These tasks took about 20 minutes.

Oral discussions were tape recorded. The researcher displayed each question in poster form to respondents in oral discussion. Words were collected both from tape recorded oral discussions and from written portions. The researcher interpreted comments that respondents made during the focus group interviews.

Word List Development

Descriptors for fabric hand were collected from the five focus group interviews and the literature review: 165 English words from the focus group interviews and 195 English words from the literature review; 146 Korean words from the focus group interviews and 4 Korean words from the literature review. Many English adjectives from the focus group interviews overlapped with the words from the literature review. Four Korean words (noun form) from the literature review were included among the Korean descriptors from the focus group interviews.

The researcher found two Korean articles related to fabric hand (Kim & Yoon, 1983; Lee & Kim, 1983). One article used both Korean words and English translations in the instrument. Another used both English terms and Japanese terms.

Comparing English and Korean words

The researcher compared the English words with the Korean words. If an English word has no equivalent word in Korean, the researcher translated it or vice versa. An English-Korean dictionary was used for translation (New world concise English-Korean dictionary, 1979). However, some words could not be translated.

Some English words represented more than one concept when they were translated into Korean. This was true of Korean words too. For example, "crisp" means something which is firm but easily broken. The researcher translated "crisp" into "*basakbasakhan.*" "*Basakbasakhan*" expresses two concepts: one is "crisp" and the other is "rustle," which is related to "noisy" in Korean. In addition, some English words were not differentiated in Korean: "strong," "sturdy," and "tough," "fragile," and "weak."

All words were categorized into 24 groups that represent characteristics of fabric hand. These categories are listed in Table 3. The basic idea for categorization of words came from Chang's research (1986). Ten of these categories were adapted from Chang's research; 14 additional categories were developed by the researcher based on words provided in focus group interviews and in the literature. The End-use and Aesthetic categories were eliminated because most words in these categories were not adjectives. In addition, the End-use category contained no words from the literature review. No words in the Aesthetic category appeared either in the focus group interviews or the literature review.

From the 22 remaining categories, the researcher selected a list of adjectives including 131 each of corresponding unipolar adjectives in English and Korean, with the goals that they

are familiar to consumers (naive judges) and that they are hand descriptors describing various fabrics.

The list of 131 unipolar adjectives, grouped in categories, was mailed to a panel of five judges who were native Korean-speaking faculty members in Textiles and Clothing departments of universities in the United States and Korea. They were asked to respond as to whether the Korean words were equivalent to the English words. The researcher also conferred personally with a Korean faculty member in the Textiles and Clothing department of a major university in Korea who was fluent in both English and Korean.

Table 3. List of 24 categories for fabric hand descriptors

Categories	Categories
Aesthetic	Service or performance
Bending	Strength
Color, visual	Stretch
Comfort	Structure
Compressibility	Surface texture
Drapeability	Texture
End-use	Thermal comfort
Fabric name	Thickness
Frictional texture	Transparent visual
Luster, visual	Value judgment
Pattern, visual	Visual
Resilience	Weight

On the basis of the judges' written and oral comments, the researcher selected the Korean word that seemed to be the closest equivalent to each English word. The resulting list is shown in Appendix B.

One judge commented that "*basakbasakhan*" (crisp) is proper in describing a food sensation, but that "*basakbasakhan*" (crisp) is not appropriate for describing fabric hand. Two judges suggested that "*asakasakhan*" was an appropriate translation of "crisp." Therefore, "crisp" was translated into "*asakasakhan.*"

One judge suggested that "drapey" (*dreapeyka jaldoinun)* could be used directly as a word of foreign origin in Korean because many Korean textbooks use this word. However, naive judges in the Korean focus group interviews did not use this word of foreign origin. The other judges agreed with the researcher's translation for drapey. Therefore, "drapey" was translated into "*wooahan jurmi japinun.*"

Most judges had difficulty in differentiating English Strength category words such as "strong," "sturdy," and "tough," and "fragile," "flimsy," and "weak" in Korean. Various judges translated these words slightly differently. Therefore, the researcher decided on the translation of these Strength category words based on the judges' opinions as well as the translation in English-Korean or Korean-English dictionaries (Dong-A's new concise Korean-English dictionary, 1984; New world concise English-Korean dictionary, 1979).

The 23 adjectives were selected for the trial instrument from the list of 131 unipolar adjectives based on the following criteria (see Appendix C):

a. The adjectives describe the characteristics of the stimuli.

b. The adjectives represent various concepts related to hand of fabric.

c. The English adjectives had been used successfully in previous fabric hand research (Chang, 1986; Kim & Piromthamsiri, 1984; Winakor, Kim, & Wolins, 1980) or were used by participants in the focus group interviews.

Trial Procedure

The purposes of the trial were:

a. To develop the final instrument.

b. To determine the sample size for the final data collection.

c. To verify the procedure for administering the instrument including the amount of time needed for the administration.

The trial was administered during Spring semester, 1991 at Iowa State University.

Stimuli

Fabrics chosen for the trial were selected as possible shirting fabrics for U. S. and Korean consumers because shirts can be worn by both males and females as well as by both U. S. students and Korean students. Therefore, respondents would be able to evaluate them easily. Fabrics chosen by Chang (1986) and Winakor, Kim, and Wolins (1980) differed greatly. The results of Roberts (1963) and Kim & Piromthamsiri (1984) indicated that consumers can differentiate among similar fabrics: therefore, fabrics that differed subtly in their characteristics were selected for this research. Although all white fabrics were selected to avoid possible effects of color on responses, the fabrics were variations of white as in the focus group interview.

Fabrics were purchased from retail stores in Ames and Des Moines, Iowa during December, 1990. All fabrics were of woven construction. Each fabric was cut into swatches 20x20 cm in size. Then, each swatch was taped on one edge to grey (rated 8 by Kodak Gray Scale) hardboard 25x28 cm in size. The warp of sample was parallel with the larger side of hardboard and tape was in the filling direction. Fabrics were replaced with new swatches as they became soiled. Table 4 lists the characteristics of trial fabrics.

Instrument

The instrument had three sections (see Appendix D). The main part was the fabric hand evaluation response sheets. The evaluation sheet included the 23 unipolar adjectives. In addition, two sentence questions asked preferences for use in shirts for their own sex and for the other sex (see Table 5). Six copies of the evaluation sheet were provided to each respondent, one for each fabric to be judged. A demographic background sheet was also included in the instrument. A cover letter explained the purpose of the research to the respondents, and informed them that participation was voluntary.

An 11-point certainty scale (Warren et al., 1969) was used for responses to the unipolar adjectives and the two sentence questions. If respondents were completely certain that the word described the hand of the fabric, they used +5. If they were not completely certain, they used a number between +4 and +1 to indicate how certain they were that the word described the hand of the fabric. When respondents were completely certain that the word did not

Table 4. Description of trial fabrics

Name or description	Fiber content	Symbol	Description
Corduroy	100 % cotton	A	Pile weave
Crepe	100 % acetate	B	Crepe weave
Oxford	60 % cotton 40 % polyester	C	Plain weave variation
Denim	100 % cotton	D	Twill weave
China silk	100 % silk	E	Plain weave
Crash	50 % polyester 50 % rayon	F	Plain weave

Table 5. List of adjectives and question items

Trial		Final administration
English term	Korean term	
Crisp	아삭아삭한	
Heavy	무거운	x
Smooth	매끈한	x
Drapey	우아한 주름이 잡히는	
Stiff	뻣뻣한	x
Absorbent	흡수성이 있는	x
Even	고른	x
Expensive	값비싸 보이는	x
Shiny	빛이 나는	x
Soft	부드러운	x
Flexible	유연한	x
Cool	시원한	x
Loose	느슨한	x
Flowing	잘처지는	x
Strong	강한	x
Fuzzy	잔털이 있는	x
Harsh	꺼끌꺼끌한	x
Feminine	여성스러운	
Sheer	비치는	x
Durable	내구성이 있는	x
Thick	두꺼운	x
Elastic	신축성이 있는	
Masculine	남성스러운	
I would choose this fabric for myself.	이 직물은 나의 셔츠를 위한 섬유로 선택할만 하다.	x
I would choose this fabric for a shirt for female (male).	이 직물은 남성 (여성)의 셔츠를 위한 섬유로 선택할만 하다.	x

describe the hand of the fabric, they circled -5. When they were not completely certain the word did not describe the hand of the fabric, they used a number between -4 and -1 to indicate how certain they were that the word did not describe the hand of the fabric. If respondents were uncertain that the word described the hand of the fabric, they circled 0. The last two questions asked the respondent's preferences for hand for himself or herself and for the other sex.

The information sheet described the background of each respondent, including year in school, age, sex, and major field of study.

Judges

Respondents were 80 Iowa State University students: 20 each of native Korean speaking males and females and 20 each of native English speaking U. S. males and females.

Sample size of the trial was decided based on the standard deviations of similar studies (Lubner-Rupert & Winakor, 1985; unpublished data from Manikowske & Winakor, 1991). Volunteers were recruited at Iowa State University or by word of mouth through contact with friends. The researcher approached students in the Parks Library study space or in LeBaron and MacKay Halls and asked them to participate in this research. If students were willing to participate in the research, they arranged a time with the researcher or evaluated the fabrics at that time.

The demographic characteristics of trial respondents are shown in Table 6.

Administration

The trial was administered between February 9 and April 17, 1991 to respondents in classrooms, library study areas, and a dormitory lounge at Iowa State University. The spaces

where the instrument was administered had fluorescent lighting or daylight from uncurtained windows or both.

The order of presentation of the six fabrics was determined using a table of random numbers. Five different random orders were used to reduce the order effect.

Groups ranged in size from three to seven, with a modal size of five. Two U. S. groups included both males and females; all others contained either all males or all females. Respondents sat around a table; each had a set of swatches to handle the fabrics. Respondents freely saw and touched each fabric. After completing evaluations of the six fabrics, they filled out the background questionnaire. These tasks took 20 minutes. Respondents appeared not to be bored or frustrated. Therefore, the task was considered reasonable in length.

Table 6. Demographic characteristics of trial respondents

Group	Korean		U. S.	
	Female	Male	Female	Male
Number	20	20	20	20
Year in school				
Undergraduate	4	5	16	13
Graduate	16	15	4	7
Age				
18-21	-	1	12	8
22 or older	20	19	8	12
College				
Agriculture	2	1	3	9
Business	1	2	3	4
Design	3	-	-	-
Education	1	1	3	-
Engineering	1	5	-	2
Family & Consumer Sciences	7	-	5	1
Sciences & Humanities	5	11	6	4

Analysis of data

Responses to the adjectives were transformed to approximately normalized ranks which could range from -8 to +8 (Pearson & Hartley, 1954, p. 175). The transformations are indicated below:

Responses	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Transformed value	+8	+5	+3	+2	+1	0	-1	-2	-3	-5	-8

Based on the transformed data, the following statistical values were examined to see the distributions of responses and how well unipolar adjectives functioned: frequencies of responses and correlations among responses to adjectives. The means and standard deviations of responses were used to compute sample size for the final data collection. The findings were used for the final instrument development.

Findings

A word was removed from the list of hand adjectives (Table 5) if either the English or the Korean word seemed to function poorly. The adjective "elastic" was eliminated because the fabrics used in the trial displayed little variation in this property. For the "elastic" adjective, over 50 percent of the transformed responses in each group of U. S. and Korean males and females were between -3 and -8. Most respondents reported the stimuli to be inelastic.

"*Asakasakhan*" (crisp) was eliminated because Korean respondents did not understand it. As mentioned, an expert judge had commented that "*basakbasakhan*" (crisp) is proper in evaluation of food sensation; however, "*basakbasakhan*" (crisp) is not appropriate for evaluation of fabric hand. Two expert judges had suggested that "*asakasakhan*" was appropriate for evaluation of fabric hand. After completing evaluation of fabrics, the

respondents discussed the adjectives in the instrument freely with the researcher. Many respondents in the trial could not relate "*asakasakhan*" (crisp) to hand of fabric. They could understand "*asakasakhan*" (crisp) as related to food sensations. For the adjective "*asakasakhan,*" 15 percent of responses were zero (uncertain) in the Korean male group. This suggests that the Korean male group did not understand the adjective "*asakasakhan.*"

The adjective "*wooahan jurmi japinun*" (drapey) had two meanings such as "crease" and "drapey" among Korean respondents. During the evaluation of fabrics, many Korean respondents asked what "*wooahan jurmi japinun*" (drapey) meant. In addition, 18.3 percent of responses were zero (uncertain) for the adjective "*wooahan jurmi japinun*" in the Korean male group. Therefore, "*wooahan jurmi japinun*" (drapey) was eliminated.

The adjectives "masculine" and "feminine" were eliminated because they were highly correlated with sentence items 24 and 25 (see Table 7): "masculine" with item 25 among female groups, "masculine" with item 24 among male groups, and "feminine" with item 25 among the Korean male group.

Table 7. Pearson product-moment correlations among selected items across the six fabrics

Group	Item	Feminine	Masculine
Korean			
Female	item 24	.46	-.07
	item 25	-.34	.70[a]
Male	item 24	-.38	.77[a]
	item 25	.71[a]	-.46
U.S.			
Female	item 24	.40	-.03
	item 25	-.45	.86[a]
Male	item 24	-.47	.76[a]
	item 25	.58	-.32

[a] indicates a common variation greater than 50 % between the two variables.

Table 5 shows how the trial list of 25 items was reduced to 20 items for the final instrument.

Sample size for the final data collection was decided based on the standard deviations and means of the trial. The following formulas were used to decide sample size (n) (Steel & Torrie, 1980).

$$n=\frac{2(Z_{\alpha/2}+Z_{\beta})^2 s^2}{(\bar{x}_1-\bar{x}_2)^2}$$

$$s^2=\frac{s_1^2(n_1-1)+s_2^2(n_2-1)}{(n_1-1)+(n_2-1)}$$

where $Z_{\alpha/2}$=1.96 from *t*-table value of *t*, p=.05, n=∞

Z_{β}=1.28 from *t*-table value of *t*, p=.90=1-β

$\bar{x}_1$=mean of male group

$\bar{x}_2$=mean of female group

n_1=sample size of male group

n_2=sample size of female group

s_1=standard deviation of male group

s_2=standard deviation of female group

Estimates of sample sizes were computed for selected items, based on their standard deviations. The range of sample sizes was from three to 12,166. Therefore, as a compromise, the researcher chose a sample size approximating the median of the range. Sample size for the final data collection was set at 70 for each sex and language group.

Final Data Collection

The final instrument included three sections; a cover letter, seven fabric hand evaluation response sheets, and a demographic background sheet (see Appendix E). Instruments were the same as the trial instruments except for the fabric hand evaluation respondent sheets and demographic background sheet for U. S. respondents. As explained, the list of 25 items in the trial was reduced to 20 items for the final instrument. Because many classes at Iowa State University included native English speakers as well as non-native English speakers, one question asked the language spoken in their childhood. If a student had used English since elementary school, s/he was considered as a native English speaker.

Stimuli

Fabrics chosen for the final data collection were selected as possible shirting fabrics for Korean and U. S. consumers, as in the trial procedure. The researcher selected 25 swatches from retail stores (20 from Iowa and five from Seoul) and from these selected seven fabrics to represent various fiber contents and fabric and yarn structures. All were woven, and weights of fabrics were similar because, in focus group interviews, heavy denim was not recognized as a shirting fabric. The seven fabric swatches are shown in Appendix F.

Six fabrics were purchased from retail stores in Ames and Des Moines, Iowa during April 1991. One fabric was purchased from a retail store in Seoul, Korea during May 1991. Each fabric was cut into swatches 20x20 cm in size. Then each swatch was taped on one edge to grey hardboard 25x28 cm in size. All fabrics were variations of white as in the trial procedure. The value level of and tint whiteness was measured by colorimeter (measured by Color Mate^{TM} of Milton Roy Company).

The characteristics of fabrics are shown in Table 8. The following physical hand properties were measured: stiffness, thickness, drapability, and fabric weight. Fabric specimens were conditioned at standard temperature ($70 \pm 20\ ^{\circ}F$) and humidity ($65 \pm 2\%$ R. H.) for at least 48 hours before testing. In addition, fabric specimens were not taken from the areas nearer to selvages than one tenth of the width of the fabric. Five replications were done for each test.

Measurement of stiffness Stiffness of the seven fabrics was measured by the bending length using a FRL Cantilever Bending Tester. The test method was ASTM D1388 Standard Test Methods for Stiffness of Fabrics (ASTM, 1989). Option A, Cantilever Test, was used.

Table 8. Description of fabrics for the final data collection

Fabric	Fiber Content	Symbol	Whiteness	Description
Carded blend twill	65% rayon 35% polyester	A	White with medium yellowish caste	Twill weave, spun yarn
Crash	100% linen	B	White with slight yellowish caste	Plain weave, spun yarn
Flat crepe	100% polyester	C	White with slight yellowish caste	Crepe weave, filament yarn
Moss crepe	80% acetate 20% rayon	D	White with slight greenish caste	Granite weave, filament yarn
Balanced taffeta	100% polyester	E	White with slight greenish caste	Plain weave, filament yarn
Oxford cloth	60% cotton 40% polyester	F	White	Half basket weave, spun yarn
Crash	50% polyester 50% rayon	G	White with medium bluish caste	Plain weave, spun yarn

Measurement of thickness A Schiefer Compressometer was used to measure thickness of fabric. The test followed was ASTM D1777 Standard Method for Measuring Thickness of Textile Materials (ASTM, 1989). The thickness was measured at the pressure of 0.5 pounds per square inch under a presser foot having a one-inch diameter.

Measurement of drapability A Cusick Drape Tester was used to measure drape coefficient (Merkel, 1991). The drape coefficient was calculated by the following equation:

Drape coefficient = $W_2/W_1 \times 100$.

W1 = the weight of whole paper ring

W2 = the weight of paper cut along the trace, representing the shadow area

Measurement of weight The test was performed according to ASTM D3776 Standard Method for Mass Per Unit Area (Weight) of Woven Fabrics (ASTM, 1989). Option C for small swatches of fabric was used.

Judges

Korean judges Final data collection from Korean respondents took place between May 23 and June 10, 1991 at Seoul National University in Korea. Respondents were 140 Seoul National University students: 70 each of native Korean speaking males and females.

Volunteers were recruited in classes. An instructor briefly introduced the researcher and then the researcher explained the purpose and procedure of the research. If a student did not want to participate in this research, she or he left the class. One Korean graduate student helped with the administration.

U. S. judges Final data collection from U. S. respondents took place between September 9 and October 16, 1991 at Iowa State University. U. S. Respondents were 155 Iowa State University students: 87 U. S. male students and 68 U. S. female students. Among

the 87 male students, 16 male students were non-native English speakers and one male student did not respond for one fabric. Therefore, 17 male students were not included in the analysis.

Administration

The data collection took place in classrooms or dormitory lounges. The environmental conditions where the instrument was administered were 21 ± 4 °C and 70 ± 5% R. H. in Korea and 24 ± 2 °C and 47 ± 12% R. H. in the United States. The classrooms and lounges in Korea and the United States had fluorescent lighting, daylight from uncurtained windows, or both.

Groups ranged in size from 3 to 27. One Korean group included both males and females; all others contained either all males or all females. Four U. S. groups included both males and females. The following administration was common in Korea and the U. S. Respondents sat around a table or at their own desk chairs; each had a set of swatches. Respondents freely saw and touched each fabric. In addition, students could ask the researcher if they had questions. The order of presentation of the seven swatches was determined using a table of random numbers as in the trial. Five different random orders were used to reduce the order effect. Although students were given the seven swatches in sequence, they could go back to and look at the early swatches if they wished. These tasks took about 20 minutes.

Analysis of data

Responses to the unipolar adjectives were recorded on an 11-point certainty scale and then transformed to approximately normalized ranks which ranged from -8 to +8 as in the trial analysis. In general, very few data were missing (0.16 % of total responses and fewer than three per respondent) and these were randomly scattered. For missing data, the mean for that fabric for that item and that type of person was calculated, and then missing data were replaced by this mean.

The means and standard deviations of the U. S. and Korean males and females were calculated and plotted to examine the response patterns of males and females as well as native-English speakers and native-Korean speakers.

Analyses of variance were performed for each of 20 items and for the seven fabrics using the total data set and subsamples by country and sex. Sixty-eight U. S. females were used for analyses compared with 70 for each of the other groups. Therefore, PROC GLM (General Linear Models) was used for unbalanced data (SAS/STAT User's guide, 1989).

CHAPTER IV. RESULTS

Respondents

Data were collected from Iowa State University students at Ames, Iowa and Seoul National University students at Suwon, Korea. Table 9 describes the characteristics of the 278 students whose responses were used in this research: 70 each of native Korean speaking males and females: 70 native English speaking males and 68 native English speaking females.

Most respondents were undergraduate and unmarried students. The majority of Korean respondents attended the Agricultural College; among the 67 Korean females in the Agricultural College, 49 respondents were Home Economics majors. About 81 percent of U. S. females were majoring in the Family & Consumer Sciences College; about 83 percent of U. S. males were Engineering College majors. Over 67 percent of male respondents were 22 years old or older, whereas over 54 percent of female respondents were 18 to 21 years old.

Physical Hand Properties of Fabrics Selected for Final Data Collection

All seven fabrics were tested instrumentally to determine physical hand properties: stiffness, thickness, fabric weight, drapability, and yarn count. Table 10 shows measured data of these physical properties. Based on these data, Fabric B, which is linen, was stiffest because its bending length and drape coefficient were highest among the seven fabrics. Fabric F was nearly as stiff. Fabrics A and F were the thickest fabrics, whereas Fabric C was thinnest and least stiff.

Table 9. Demographic characteristics of respondents for final procedure

Group	Korean (frequency)		U.S.(frequency)	
	Female	Male	Female	Male
Number	70	70	68	70
Year in school				
Undergraduate	65	59	66	70
Graduate	5	11	2	-
Age				
18-21	38	10	48	23
22 or older	32	60	20	47
College				
Agriculture	67	70	2	-
Business	-	-	2	3
Design	-	-	2	2
Education	-	-	2	1
Engineering	-	-	4	58
Family & Consumer Sciences	-	-	55	2
Sciences & Humanities	-	-	1	4
Veterinary Medicine	3	-	-	-
Marital status				
Married	-	3	6	10
Unmarried	70	67	62	60

Analyses of Variance Using the Total Sample

The means and standard deviations of responses of the U. S. and Korean males and females were calculated and plotted to examine the response patterns of males and females as well as English speakers and Korean speakers. Figures 1, 2, 3, and 4 show examples of scatter plots of means and standard deviations for U. S. and Korean males and females. Tables 11 and 12 compare frequency of larger means (absolute value) and standard deviations for the sexes.

For the U. S. respondents, female means were larger than male means for more than half the 20 items for every fabric (Table 11). For fabric C, the U. S. males had larger standard deviations for ten items (Table 12). However, for all other fabrics, the U. S. females had

Table 10. Physical hand properties of sample fabrics for final procedure

Fabric	Bending length (cm)		Fabric weight	Yarn count (no/in)		Thickness	Drape coefficient
	Warp	Filling	(g/m^2)	Warp	Filling	(mm)	(%)
A	4.70	3.88	213.7	62	62	0.16	40.58
B	7.30	5.86	141.1	61	55	0.11	74.70
C	3.62	2.74	83.2	99	102	0.05	17.04
D	4.14	3.46	153.4	93	66	0.12	28.30
E	3.24	3.64	97.3	116	88	0.10	24.18
F	5.40	4.90	174.6	45	45	0.16	70.42
G	4.28	3.90	142.4	64	62	0.12	50.00

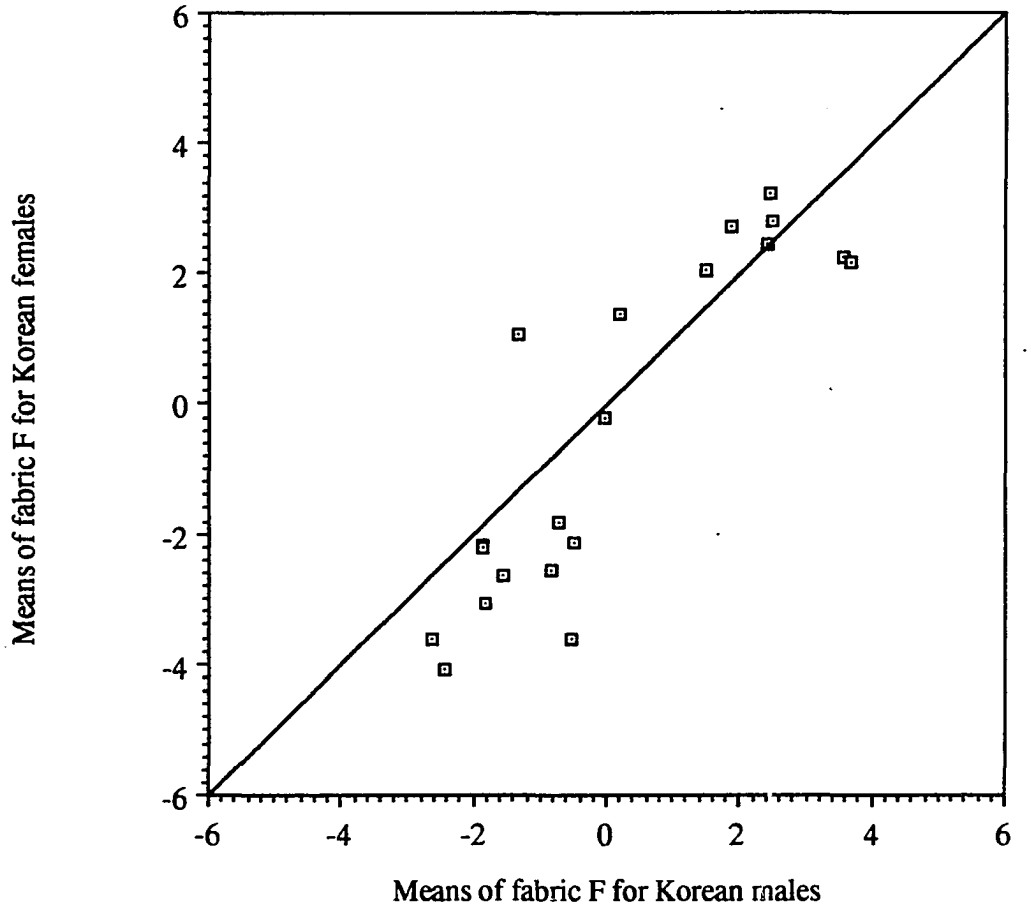

Figure 1. Plot of Korean males' and females' means of transformed responses for 20 items for fabric F

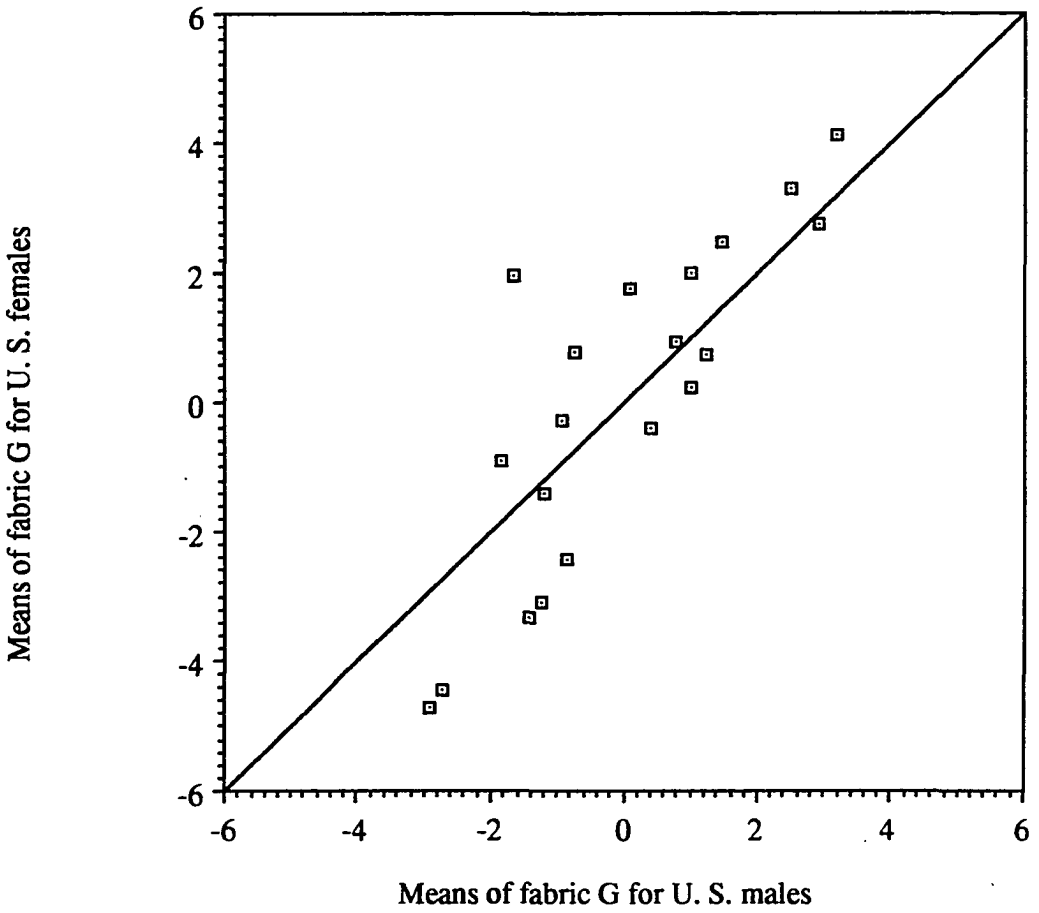

Figure 2. Plot of U. S. males' and females' means of transformed responses for 20 items for fabric G

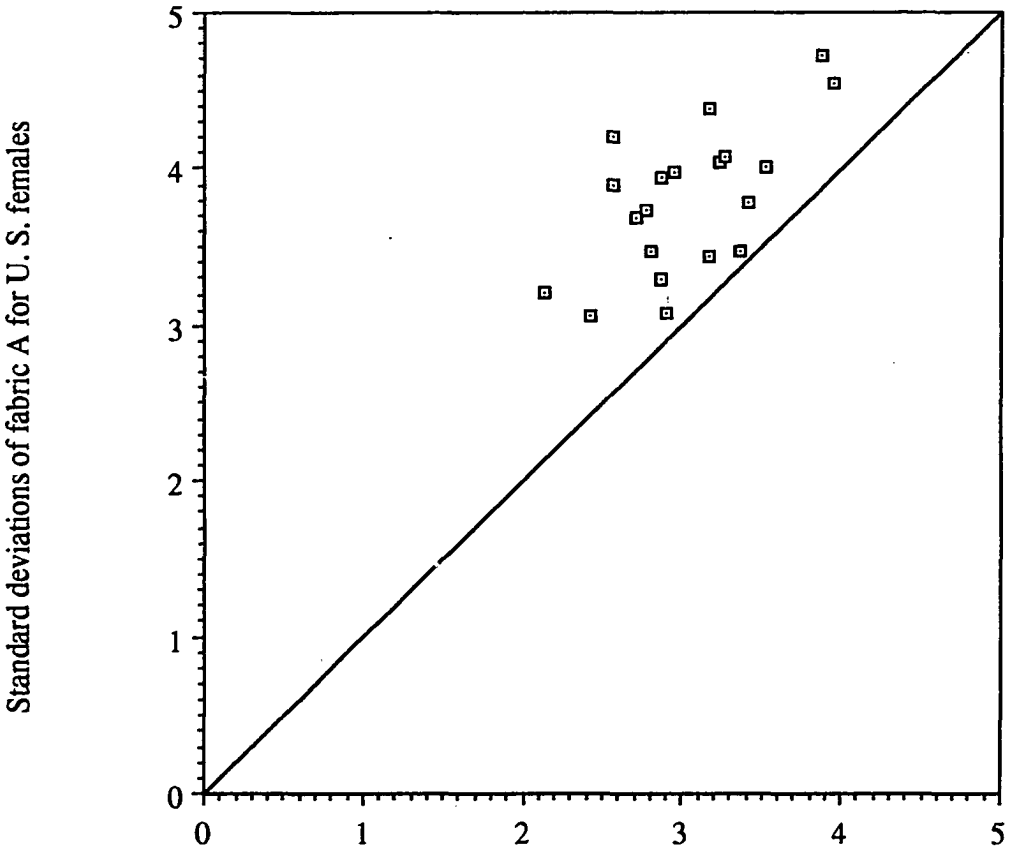

Figure 3. Plot of U. S. males' and females' standard deviations of transformed responses for 20 items for fabric A

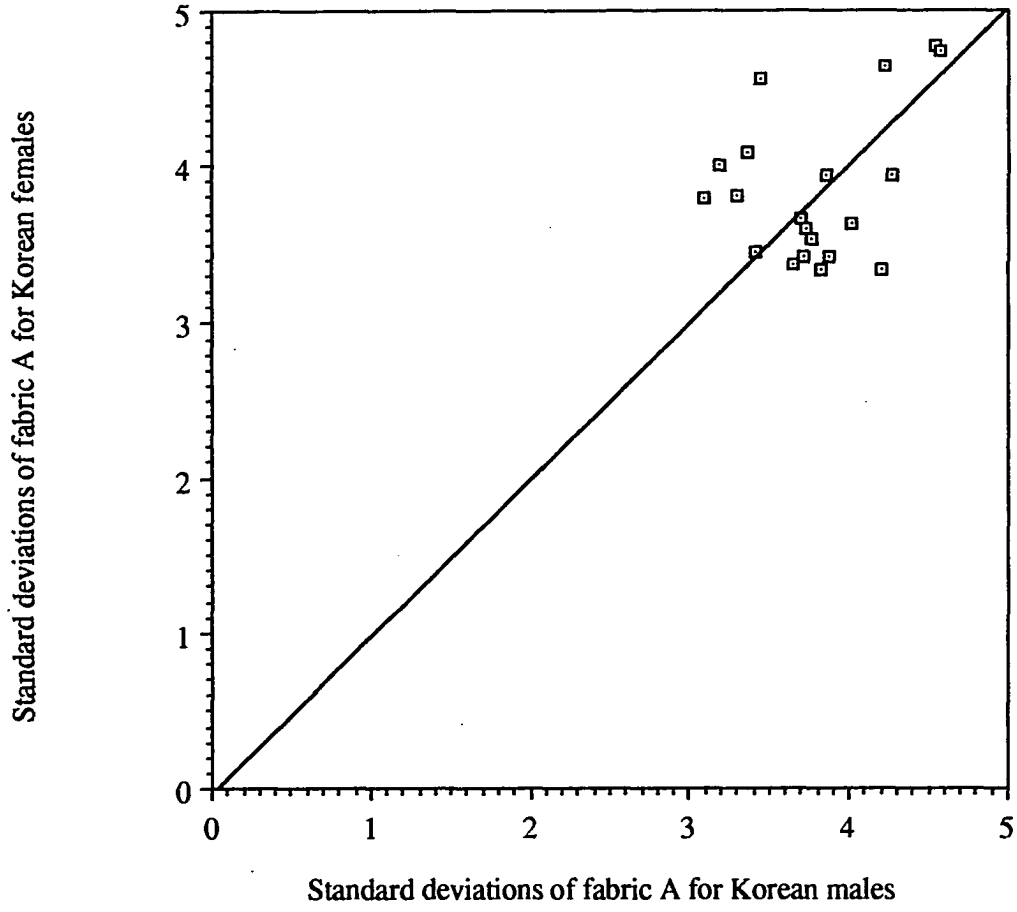

Figure 4. Plot of Korean males' and females' standard deviations of transformed responses for 20 items for fabric A

larger standard deviations for 17 or more of 20 items. For fabric A, all the females' standard deviations were larger than males' standard deviations (Figure 3). For the U. S. males and females, standard deviations of fabrics A and G were significantly different in that 100 percent and 95 percent, respectively, of the standard deviations were larger for females.

For the Korean sample, males had more large means than females did for fabric A (Table 11). However, for other fabrics, females had more large means than males did. For standard deviations, males had more large standard deviations for fabrics B, C, and G (Table 12); the numbers were equal for fabric A (Figure 4). Korean females had more large standard deviations for fabrics D, E, and F.

Table 11. Frequency of larger means for the sexes for each fabric

Fabric	Frequency of larger means (absolute value)			
	U. S.		Korean	
	Male (%)	Female (%)	Male (%)	Female (%)
A	6 (30)	14 (70)	11 (55)	9 (45)
B	8 (40)	12 (60)	5 (25)	15 (75)
C	4 (20)	16 (80)	4 (20)	16 (80)
D	6 (30)	14 (70)	7 (35)	13 (65)
E	5 (25)	15 (75)	8 (40)	12 (60)
F	8 (40)	12 (60)	3 (15)	17 (85)
G	6 (30)	14 (70)	9 (45)	11 (55)
Average	6 (30)	14 (70)	6.7 (34)	13.3 (66)

The response pattern of native English speakers suggests that the U. S. females were more certain about their responses than the males were. The U. S. females' responses were also more heterogeneous than those of the males. The response pattern of U. S. males and females in this research was similar to those reported by Winakor, Canton, and Wolins (1980), Manikowske and Winakor (1991), and Horne (1991). However, the response pattern of native Korean speakers was different from that of native English speakers. Although the means indicated that Korean females were more certain about their responses than the males were, Korean females' standard deviations were about the same as those of Korean males. Korean females' responses had larger standard deviations than those of Korean males for 59 percent of the items.

Table 12. Frequency of larger standard deviations for the sexes for each fabric

Fabric	Frequency of larger standard deviations			
	U. S.		Korean	
	Male (%)	Female (%)	Male (%)	Female (%)
A	0 (0)	20 (100)	10 (50)	10 (50)
B	2 (10)	18 (90)	11 (55)	9 (45)
C	10 (50)	10 (50)	13 (65)	7 (35)
D	2 (10)	18 (90)	6 (30)	14 (70)
E	3 (15)	17 (85)	3 (15)	17 (85)
F	2 (10)	18 (90)	3 (15)	17 (85)
G	1 (5)	19 (95)	11 (55)	9 (45)
Average	2.9 (14.5)	17.1 (85.5)	8.1 (40.5)	11.9 (59.5)

For analysis of variance, Winakor, Canton, and Wolins (1980) analyzed their data separately by sex because response patterns of males and females were different. Manikowske and Winakor (1991) examined their data separately by sex as well as together. Horne (1991) also analyzed her data separately by husbands and wives and for both together. In the present research, data were examined together and also separately by sex with country as a variable and by country with sex as a variable.

The model for the total sample is:

$$Y_{ijkl} = \mu + C_i + F_j + CF_{ij} + S_k + CS_{ik} + FS_{jk} + CFS_{ijk} + \varepsilon_{ikl} + \varepsilon_{ijkl}$$

C= country, i= U. S. or Korea

F = fabric, j= A, B, C, D, E, F, G

S = sex, k= male, female

R = respondents, l= 1 .....70 or l= 1 68

ε_{ikl} = error term for country, sex, and their interaction; respondents within country and sex

ε_{ijkl} = error term for fabrics and their interactions

The term ε_{ikl} represents the fact that subjects were responding to the same items for seven fabrics. This model assumes that variances and correlations among fabrics are same. If the assumptions about variance and correlation are incorrect, the denominator degree of freedom for fabric and their interactions would be 324 rather than 1945. The possibility was examined; it had no impact on the conclusions regarding level of significance. In analyses of variance, type III sum of squares was used for the main effects and the interactions because of the unbalanced data (SAS/STAT User's Guide, 1989).

Table 13 shows the analysis of variance model using the total sample. In the ANOVA model, country, sex, and fabric were the three main sources of variation; interactions were country by sex, sex by fabric, country by fabric, and sex by country by fabric.

Table 13. Analysis of variance model using the total sample

Effects	Type of effect	Error term	DF	Tabular F-value
Main effect				
Country	Fixed	Subject (S*C)	1/274	5% ≈ 3.84 1% ≈ 6.63
Sex	Fixed	Subject (S*C)	1/274	5% ≈ 3.84 1% ≈ 6.63
Fabric	Fixed	Subject (S*C) * Fabric	6/1945	5% ≈ 2.10 1% ≈ 2.80
Interactions				
Country by sex		Subject (S*C)	1/274	5% ≈ 3.84 1% ≈ 6.63
Sex by fabric		Subject (S*C) * Fabric	6/1945	5% ≈ 2.10 1% ≈ 2.80
Country by fabric		Subject (S*C) * Fabric	6/1945	5% ≈ 2.10 1% ≈ 2.80
Sex by country by fabric		Subject (S*C) * Fabric	6/1945	5% ≈ 2.10 1% ≈ 2.80

Main Effects

Main effects, fabric, sex, and country, were examined by analysis of variance.

Fabric The main effect for fabric tells whether there are differences in the responses across both sexes and both countries for the fabrics selected. The F-values for fabric were significant ($p \leq 0.01$) and very large for all 20 items (see Table 14) as would be expected because the fabrics chosen differ. The F-values for soft, flexible, and heavy were largest and the F-values for items 19 and 20 were smallest.

Adjectives Table 15 lists the means for the seven fabrics across both sexes and countries. If a mean is positive, the judges agreed with the descriptor. If the mean is negative, they disagreed with the descriptor. If the mean is near zero, they were uncertain about whether the descriptor applied to the fabric. If the absolute value of the mean is less than 0.5, then the response is judged by the researcher to be "uncertain." Generally the responses of judges were harmonious with the characteristics of the seven fabrics as measured by instruments. According to the physical characteristics measured by instruments, fabrics B and F were stiffest and fabrics A and F were thickest and heaviest among the seven fabrics; judges described fabrics B and F as stiff and fabrics A and F as thick and heavy. In addition, fabric C was thinnest and least stiff or least heavy based on the physical measurements; judges also described fabric C as neither stiff, thick, nor heavy. Fabrics C, D and F had the highest yarn counts, but judges described these fabrics as loose. This suggests that they might not understand this word as it is interpreted by experts in the sense of looseness of weave. Most extreme responses to fabric A, which was a carded blend twill, were for strong and sheer. Judges were highly certain that fabric A was strong and not sheer. They were also highly certain that fabric B, which was a linen crash, was not fuzzy. Fabric C, a flat crepe, had the largest number of extreme responses of any fabric; judges were highly certain that fabric C was smooth, even, expensive, soft, flexible, cool, loose, flowing, and sheer, but not

Table 14. F-values for analysis of variance of transformed responses for the main effects using total sample for 20 items

Item	Fabric	Sex	Country
Heavy	300.50**	31.31**	18.64**
Smooth	243.73**	5.16*	64.37**
Stiff	386.39**	8.19**	16.56**
Absorbent	65.14**	0.00	0.06
Even	129.08**	8.51**	0.34
Expensive	71.52**	5.00*	3.73
Shiny	118.09**	19.34**	16.24**
Soft	392.77**	2.47	4.32*
Flexible	324.20**	0.03	22.04**
Cool	143.25**	1.81	28.53**
Loose	75.19**	2.52	39.96**
Flowing	258.13**	2.74	3.70
Strong	97.23**	1.78	36.52**
Fuzzy	108.63**	28.25**	11.22**
Harsh	221.26**	18.64**	109.82**
Sheer	216.96**	3.93*	8.15**
Durable	87.02**	0.06	12.54**
Thick	266.80**	40.36**	0.26
Item 19	22.81**	41.96**	2.85
Item 20	22.00**	19.50**	0.43

* $p \leq 0.05$

** $p \leq 0.01$

Table 15. Means of transformed responses for the seven fabrics across both sexes and countries

Item	Fabric						
	A	B	C	D	E	F	G
Heavy	2.9	-1.0	-6.8	-3.1	-3.2	3.2	-2.3
Smooth	1.2	-3.0	5.2	-1.7	3.5	-2.1	-0.6
Stiff	-1.3	4.0	-6.3	-3.0	-5.3	2.4	-0.7
Absorbent	0.9	-0.7	-2.6	-2.2	0.5	1.7	0.3
Even	3.0	-1.1	4.0	0.3	4.2	1.3	-1.2
Expensive	-0.5	-1.7	3.0	-0.5	1.7	-1.3	-0.3
Shiny	-3.0	-2.9	2.2	-1.5	-0.7	-3.8	-2.9
Soft	1.9	-4.0	5.3	0.2	5.8	-1.9	0.8
Flexible	1.9	-2.7	6.0	3.6	5.3	-1.2	1.9
Cool	-1.6	3.4	3.8	2.4	0.1	-0.6	3.9
Loose	-0.7	-0.3	3.3	2.6	2.1	-1.3	1.8
Flowing	-0.6	-2.6	5.2	3.1	3.5	-2.0	0.6
Strong	3.1	1.7	-1.6	-0.6	0.1	3.0	-0.2
Fuzzy	-2.2	-4.5	-5.4	-3.5	1.2	-2.3	-3.2
Harsh	-1.6	3.2	-4.6	0.8	-4.6	1.5	-0.6
Sheer	-3.9	2.2	3.5	0.8	-0.9	-2.7	3.2
Durable	3.1	1.3	-0.9	-0.1	0.3	3.2	0.5
Thick	2.9	-1.1	-5.9	-2.6	-1.9	2.8	-2.4
Item 19	0.7	-1.4	0.8	-1.6	1.5	0.6	0.5
Item 20	0.7	-0.7	0.4	-1.8	1.3	0.5	1.0

heavy, stiff, fuzzy, harsh, or thick. The responses to fabric D, which was moss crepe, were all moderate. Fabric E, which was balanced taffeta with a brushed surface, had extreme responses to stiff, soft, flexible, and harsh; judges were highly certain that fabric E was soft and flexible, but not absorbent or harsh. Most extreme responses to fabric F, which was oxford cloth, were to shiny, strong, and durable. Judges were highly certain that fabric F was strong and durable, but not shiny. Fabric G, a blended crash of polyester and rayon, was described as the coolest among the seven fabrics.

Preferences Generally respondents preferred fabrics A, E, F, and G for themselves (Item 19) as well as for the other sex (Item 20). However, they did not prefer fabrics B and D for themselves nor for the other sex.

Sex The hypothesis concerning sex differences was that male and female consumers do not differ in their responses to fabric hand. The main effect for sex was used in part to test this hypothesis.

Adjectives Figure 5 shows the means for males and females for 20 items across both countries and all fabrics; Appendix G lists these means. Generally both males and females described the seven fabrics as not heavy, stiff, shiny, fuzzy or thick. Both males and females described the seven fabrics as even, soft, flexible, cool, loose, flowing, strong, and durable. In addition, both males and females were uncertain that absorbent and expensive described the fabrics.

Asterisks in Figure 5 indicate significant differences between male and female responses. Table 14 lists the F-values and their significances for each of 20 items. The F-values for sex were significant for 10 of the 18 adjectives. The largest F-value was for thick.

The largest differences between the responses of males and females to fabric hand, in descending order, were for thick, fuzzy, shiny and heavy. The females were more certain than

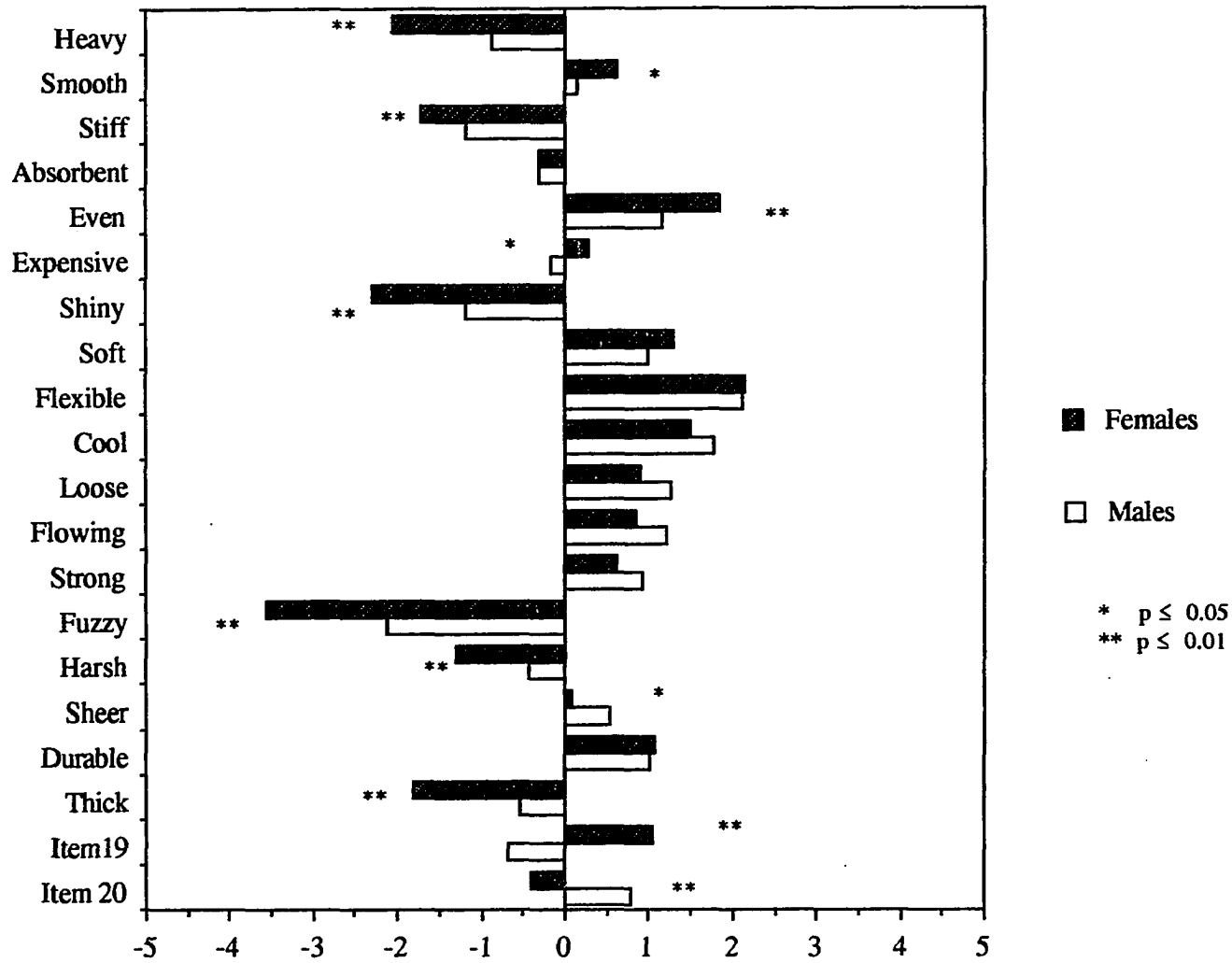

Figure 5. Means for males and females for 20 items across both countries and all fabrics

the males were that these words did not describe the fabrics. In addition, the responses for females were significantly larger (absolute value) than the responses for males for the following words: smooth, stiff, even, expensive, and harsh. Although the word expensive showed significant difference between males and females at the five percent level, the means for both males and females were below 0.5. Therefore, both were uncertain of it. The more extreme responses of females may reflect sex differences in response patterns for fabric hand.

However, the males were more certain than the females were that sheer described the fabrics. The males described the fabrics as sheer (mean=0.53) , while the females were uncertain that the fabrics were sheer.

Preferences Analysis of variance for items 19 and 20 was used to test partially the hypothesis that "For a specific end use, consumers prefer the same fabrics for their own sex and for the other sex." The F-values for items 19 and 20 were significant at the one percent level. The F-value for item 19 was bigger than the value for item 20 (Table 14).

The females preferred the fabrics for shirts for themselves; they were uncertain for males. The males did not prefer the fabrics for themselves, but they preferred the fabrics for females. This shows good agreement for preferences for fabrics for themselves and for the opposite sex. The fabrics preferred by females for themselves were preferred by the males for the females' shirts.

Country The hypothesis for culture differences was that U. S. and Korean consumers do not differ in their responses to fabric hand. The country effect was used to test this hypothesis in part.

Adjectives Figure 6 shows the means for U. S. and Korean judges for 20 items across both sexes and all fabrics; Appendix G lists these means. Table 14 shows the F-values and their significances for each of 20 items. Asterisks in Figure 6 indicate significant

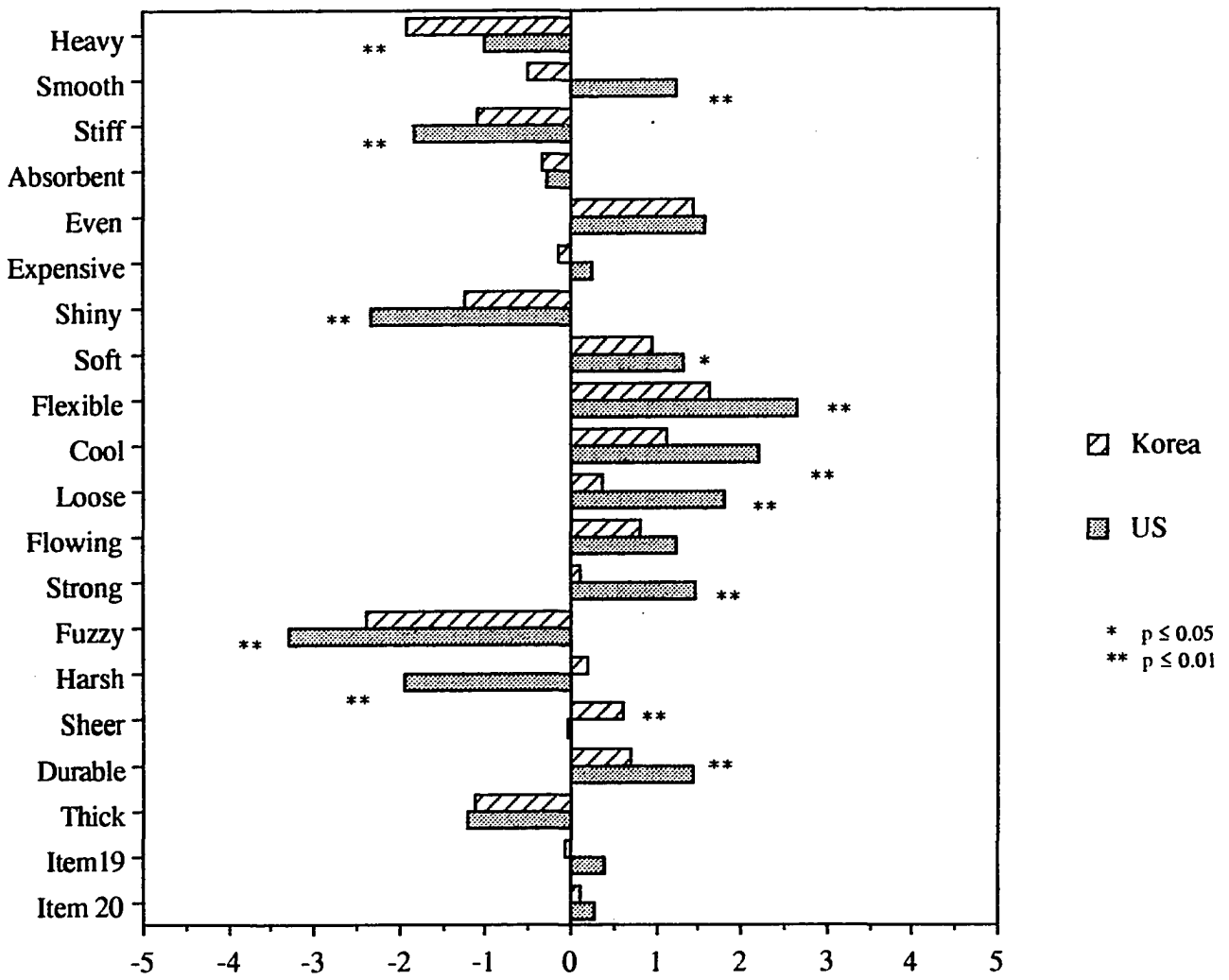

Figure 6. Means for U. S. and Korean subjects for 20 items across both sexes and all fabrics

differences between English and Korean judges. The F-values for country were significant for 13 of the 18 adjectives. The two biggest F-values were for harsh and smooth. This may be important in determining whether the adjectives were equivalent for the English and Korean languages or whether there were strong cultural differences in fabric hand perceptions. English speaking judges were very certain that the fabrics were smooth but not harsh. However, Korean judges were certain that the fabrics were not smooth, while they were uncertain for harsh. This suggests that English adjectives such as harsh and smooth may not have the same meaning as the Korean adjectives used to express these concepts. Another disagreement between the responses of English and Korean judges was for sheer. Korean judges were certain that the fabrics were sheer, while English judges were uncertain.

Generally both English and Korean speakers described the fabrics as even, soft, flexible, cool, flowing, and durable. Responses to soft, flexible, cool, and durable were significantly different between English and Korean judges. Both English and Korean judges responded that the seven fabrics were not heavy, stiff, shiny, fuzzy, or thick; responses to all words except for thick were significantly different between English and Korean judges.

English speakers had larger means (absolute value) than Korean speakers did for smooth, stiff, shiny, soft, flexible, cool, loose, strong, fuzzy, harsh, and durable, while Korean speakers had larger means than English speakers did for heavy and sheer. English speakers were more certain that the fabrics were not stiff, shiny, or fuzzy than Korean speakers were, while Korean speakers were more certain that the fabrics were not heavy than English speakers were. English speakers were more certain that the fabrics were soft, flexible, cool, loose, strong, and durable than Korean speakers were.

Preferences For items 19 and 20, the F-values were not significant. When male and female responses were combined, there was no country difference when consumers judged these fabrics for shirts for themselves or for the other sex.

Interaction effects

Two way interactions were sex by fabric, country by fabric, and country by sex. The three way interaction was sex by country by fabric. Table 16 shows the F-values and their significances for interaction effects.

Sex by fabric The interaction of sex by fabric indicated how males and females differed in responses to the seven fabrics, disregarding country. The interaction of sex by fabric was also used in part to test the hypothesis concerning sex differences.

Adjectives The F-values for sex by fabric were significant for 14 of the 18 adjectives. The biggest F-value for this interaction was for flowing. Appendix H lists means for interaction of sex by fabric.

Figures 7, 8, and 9 show examples of plots of means for significant interactions of sex by fabric. For fuzzy (Figure 7), the absolute values of means of all seven fabrics were larger for the females. For flowing, harsh, stiff, and soft, the females also had larger means than males did for each of six fabrics. For flexible, loose, and heavy (Figure 8), the females had larger means than the males did for each of five fabrics. This response pattern of interaction of sex by fabric suggests that the females were more certain about their responses than the males were.

Figure 9 shows means for interaction of sex by fabric for sheer. Females were more certain than males were that fabrics C and G were sheer; generally both males and females described fabrics C and G as sheer. However, females were more certain that fabrics A, E, and F were not sheer than males were; fabrics A, E, and F were described as not sheer by males and females. This suggests that females are more certain than males are about sheerness of sheer fabrics, while males are more certain of their responses than females are to sheer in less sheer fabrics.

Table 16. F-values for analysis of variance of transformed responses using total sample for 20 items

Item	Sex x Fabric	Country x F	C x S	S x C x F
Heavy	2.48*	4.02**	0.34	2.68*
Smooth	3.41**	6.40**	5.90*	0.62
Stiff	8.80**	2.44*	0.03	3.63**
Absorbent	6.95**	4.28**	2.87	3.40**
Even	2.28*	2.22*	0.26	0.48
Expensive	2.59*	5.48**	0.64	2.98**
Shiny	1.78	3.88**	0.20	1.71
Soft	6.10**	11.42**	5.15*	0.53
Flexible	5.90**	9.29**	0.73	1.45
Cool	1.61	55.80**	15.76**	3.08**
Loose	2.28*	3.67**	5.74*	0.69
Flowing	22.91**	2.49*	10.57*	1.38
Strong	1.63	0.36	0.09	1.37
Fuzzy	3.15**	5.53**	1.63	1.51
Harsh	4.82**	6.08**	11.83**	2.36*
Sheer	3.58**	26.07**	0.11	3.69**
Durable	1.26	5.16**	0.01	1.08
Thick	2.96**	2.57*	0.22	1.68
Item 19	17.27**	21.74**	10.59**	6.30**
Item 20	70.43**	28.32**	0.05	2.93**

* $p \leq 0.05$

** $p \leq 0.01$

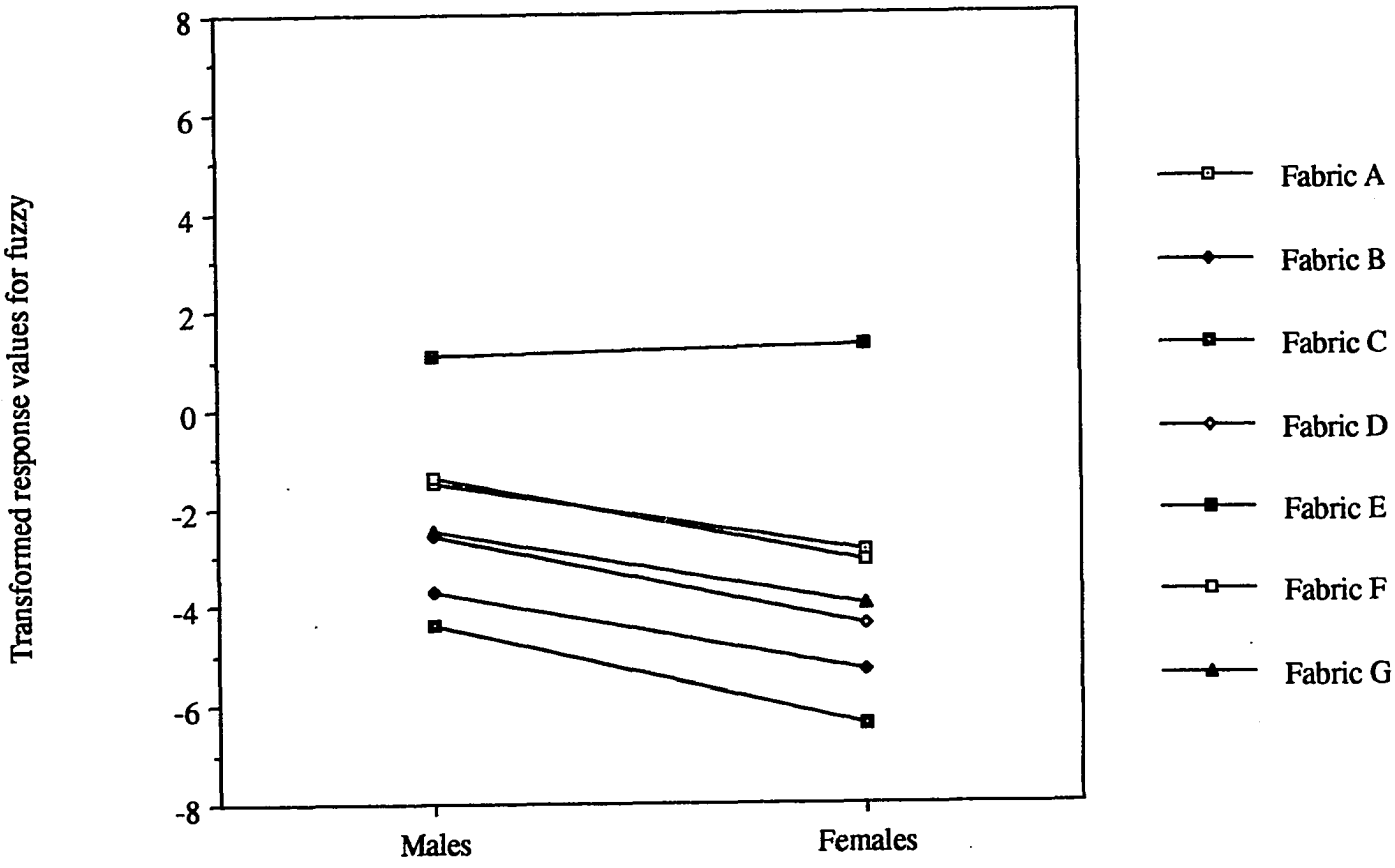

Figure 7. Means for interaction of sex by fabric for fuzzy

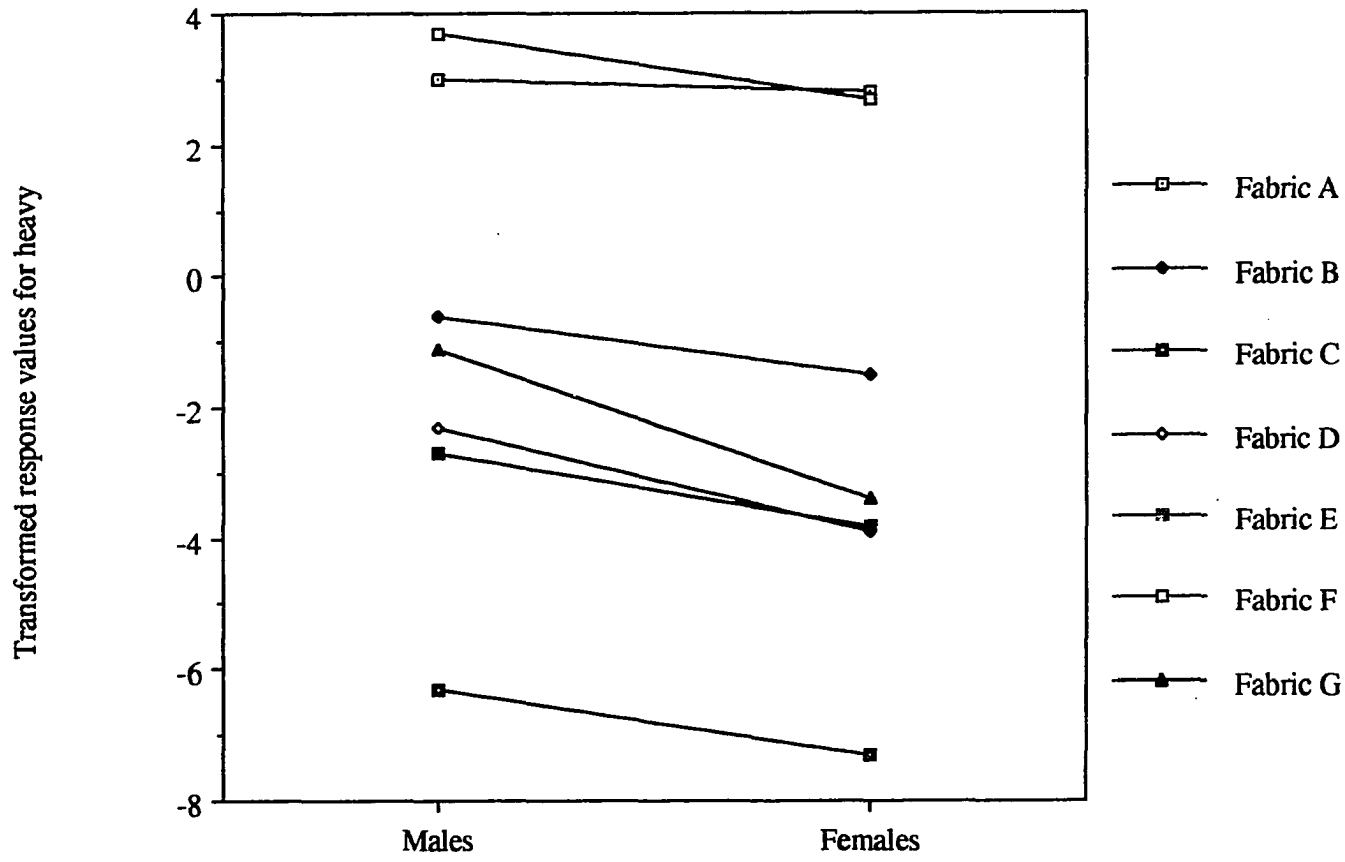

Figure 8. Means for interaction of sex by fabric for heavy

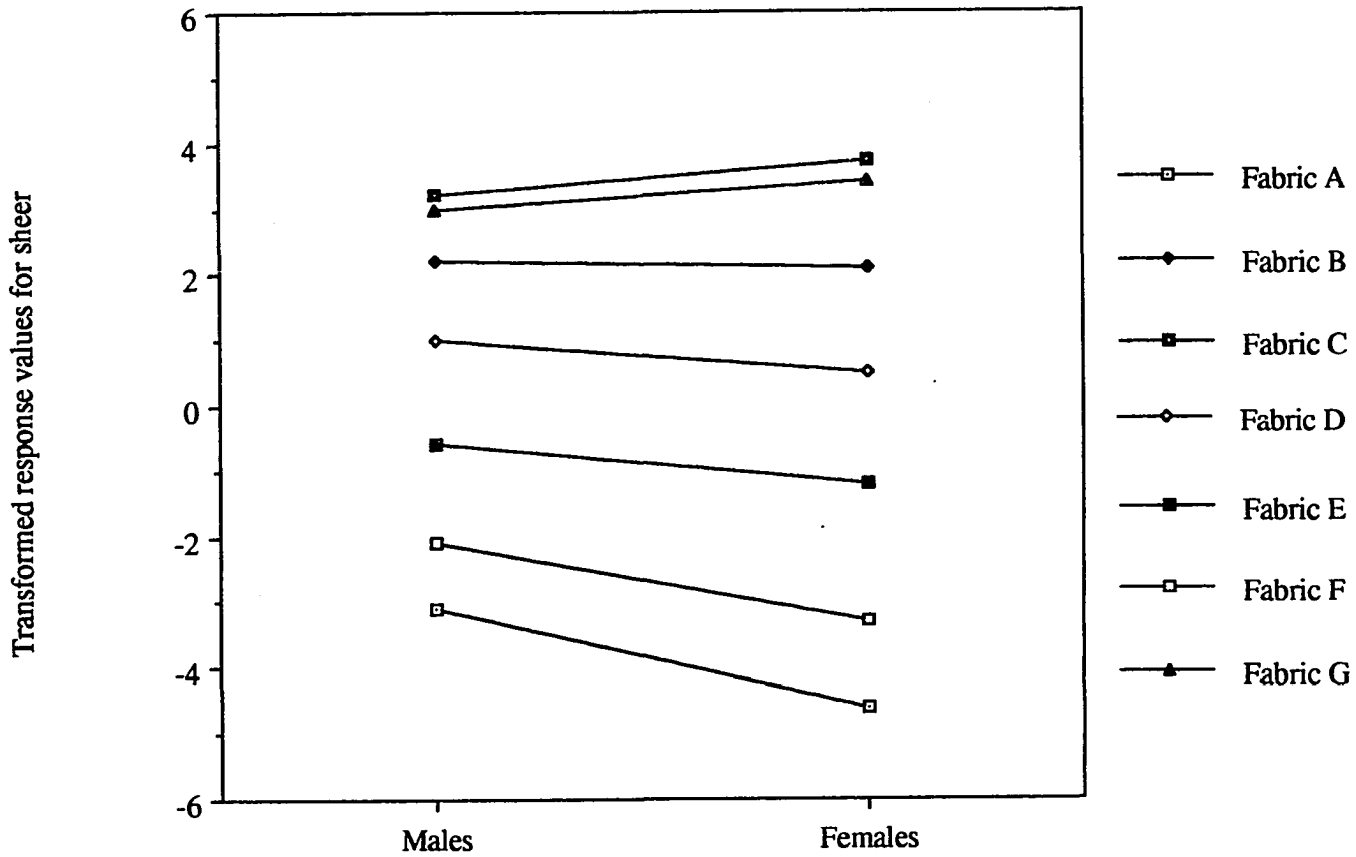

Figure 9. Means for interaction of sex by fabric for sheer

Both males and females described fabrics C and E as expensive; females were more certain that fabric C was expensive, but it was the reverse for fabric E. Males were certain that fabrics A, D, and G were not expensive, while females were uncertain of it. Both males and females were certain that fabrics B and F were not expensive.

Males responded with greater certainty than females did that fabrics A and F were thick and heavy. However, females responded with greater certainty than males did that fabrics B, C, D, E, and G were not thick or heavy.

Preferences For items 19 and 20, the interactions for sex by fabric were significant at the one percent level. The F-value for item 20 was bigger than the value for item 19.

Table 17 lists the means for the males and females for items 19 and 20 for the seven fabrics. Fabric C, which was flat crepe, was the only fabric on which there was complete agreement across both sexes; both males and females preferred it for females. The males preferred fabrics A, E, and F for themselves; the females preferred A and F for males but did not prefer fabric E for males. The females preferred fabrics A, C, E, and G for themselves; the

Table 17. Means of the males and females for preference items across countries

Fabric	Item 19		Item 20	
	Male	Female	Male	Female
A	0.6	0.8	-0.4	1.9
B	-1.9	-0.8	-1.6	0.1
C	-2.0	3.7	3.9	-3.1
D	-2.6	-0.5	0.6	-4.3
E	0.9	2.1	3.1	-0.6
F	0.8	0.3	-0.8	1.9
G	-0.7	1.7	0.7	1.3

males preferred fabrics C, E, and G for females but were uncertain about fabric A. The males did not prefer fabrics B, C, D, and G for themselves; the females agreed on fabrics C and D but preferred fabric G for males and were uncertain about fabric B. The females did not prefer fabrics B and D and were uncertain about fabric F for themselves; males did not prefer fabrics B and F for females but preferred fabric D for females.

Country by fabric The interaction of country by fabric indicated how English speakers and Korean speakers differed in responses to the seven fabrics. The interaction of country by fabric was used to test the hypothesis concerning culture differences in part. Appendix I lists means for interaction of country by fabric.

Adjectives The F-values for country by fabric were significant for 17 of the 18 adjectives. The biggest F-value for this interaction was for cool.

Figure 10 shows the interaction of country by fabric for cool. English speakers described fabric E as cool, while Korean speakers described fabric E as not cool. Fabric E was a lightweight polyester fabric with a brushed surface. English speakers were more certain than Korean speakers were that fabric C was cool. Korean speakers were more certain that fabrics A and F were not cool. However, Korean speakers were more certain than English speakers were that fabrics B and G, which were both crash, were cool (mean for fabric B for Koreans=5.2, mean for fabric G for Koreans=4.1, mean for fabric B for U. S=1.5, mean for fabric G for U. S.=3.7). This suggests that cultural perceptions of fabric are different. Traditionally crash has been used for summer fabric in Korea. Korean consumers may strongly regard crash as a cool fabric suitable for summer wear.

For sheer, Korean speakers had larger means (absolute value) than English speakers did for five of seven fabrics. Larger means indicated that judges were more certain of their responses.

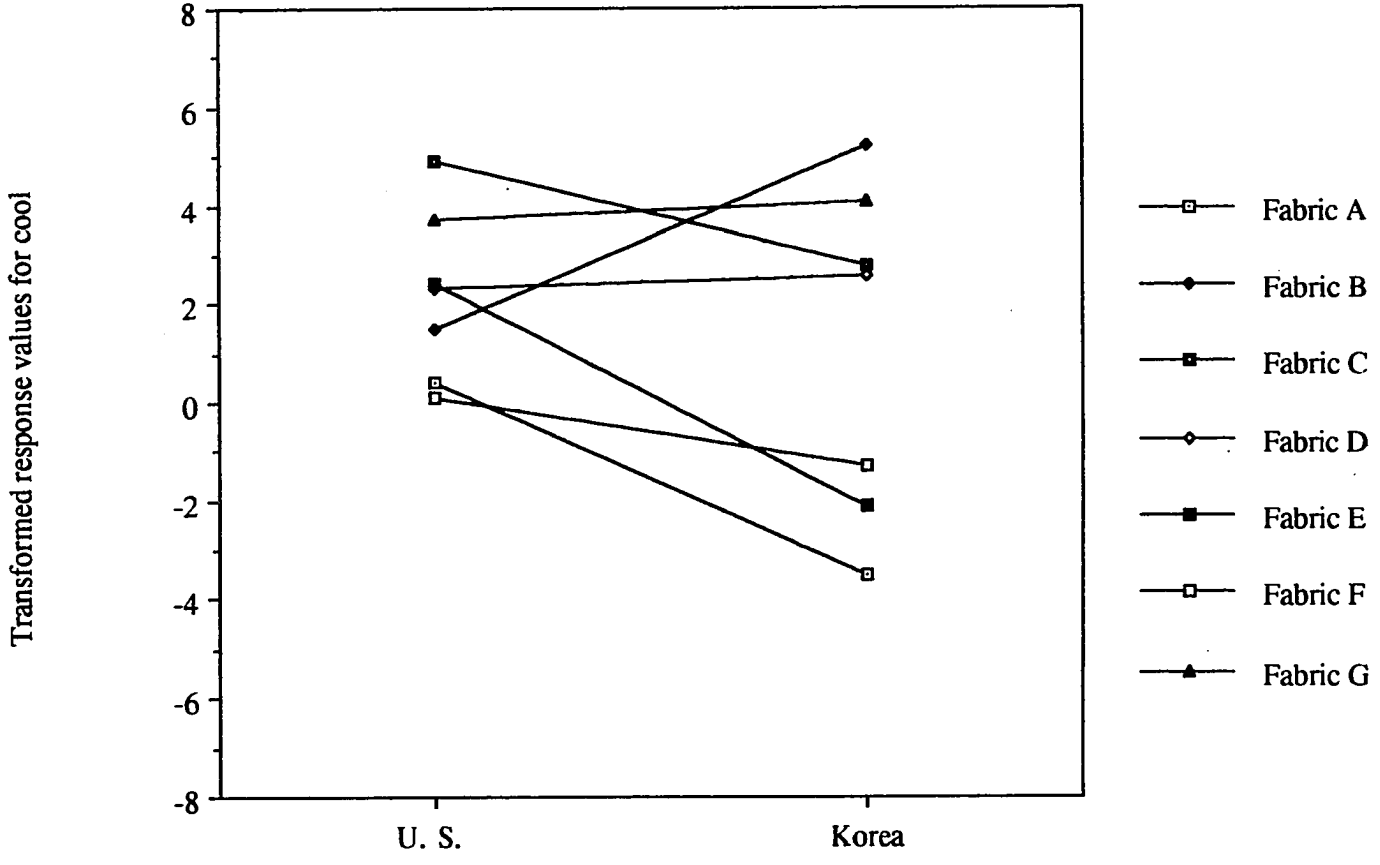

Figure 10. Means for interaction of country by fabric for cool

Preferences For items 19 and 20, the interactions for country by fabric were significant at the one percent level. The F-value for item 20 was bigger than the value for item 19.

Table 18 lists means for the U. S and Korean subjects for preference items across sex. Neither English nor Korean speakers preferred fabric D, which was a moss crepe, for themselves or for the other sex.

English speakers preferred fabric A for themselves and for the other sex; Korean speakers did not prefer this for themselves or for the other sex. It was the reverse for fabric B; Koreans preferred fabric B for themselves and for the other sex, while English speakers did not prefer this for themselves or for the other sex. English speakers preferred fabric F for themselves and for the other sex; Koreans were uncertain of it. The reverse was true for fabric G.

English speakers preferred fabric C for themselves and for the other sex; Korean speakers were uncertain for themselves and did not prefer fabric C for the other sex. English speakers preferred fabric E for themselves and for the other sex; Koreans preferred fabric E for

Table 18. Means of U. S. and Korean subjects for preference items across sex

Fabric	Item 19		Item 20	
	U. S.	Korea	U. S.	Korea
A	2.2	-0.7	2.0	-0.5
B	-3.3	0.6	-2.6	1.2
C	1.7	0.0	1.4	-0.6
D	-1.5	-1.6	-2.4	-1.2
E	2.4	0.6	2.4	0.1
F	1.2	-0.1	1.2	-0.1
G	0.1	0.9	0.0	2.0

themselves but were uncertain for the other sex.

Preferences for fabrics were different between the U. S. and Korean subjects. Korean subjects preferred crash type fabrics for themselves and for the other sex but the U. S. subjects did not or were uncertain of it. As mentioned, crash fabrics are popular for summer in Korea.

Country by sex The interaction of country by sex examined differences in the way males and females from two countries responded to the unipolar adjectives and preference items (items 19 and 20). The interaction of country by sex was used to test sex and culture differences in part.

Adjectives The F-values for country by sex were significant for 6 of the 18 adjectives. The F-values for cool and harsh were largest.

Figure 11 shows the interaction of country by sex for cool. U. S. males and females were more certain that fabrics were cool than Korean males and females were. U. S. females were more certain than U. S. males; Korean males were more certain than Korean females. Therefore, the difference between responses of U. S. and Korean females for cool was larger than the difference between U. S. and Korean males. In addition to the responses to cool, differences between responses of U. S. and Korean females were larger than the differences between responses of U. S. and Korean males for the other adjectives which were significant (see Table 19 and Appendix J). This suggests that responses of females in the two countries to fabric hand differ more in certainty than the responses of males do.

As shown in Table 19, U. S. males and females described fabrics as not harsh, while Korean males and females were uncertain; U. S. females were more certain that fabrics were not harsh than U. S. males were. U. S. males and females described fabrics as smooth and soft, while Korean males and females responded that fabrics were soft but not smooth; U. S. females were more certain that fabrics were smooth and soft than U. S males were.

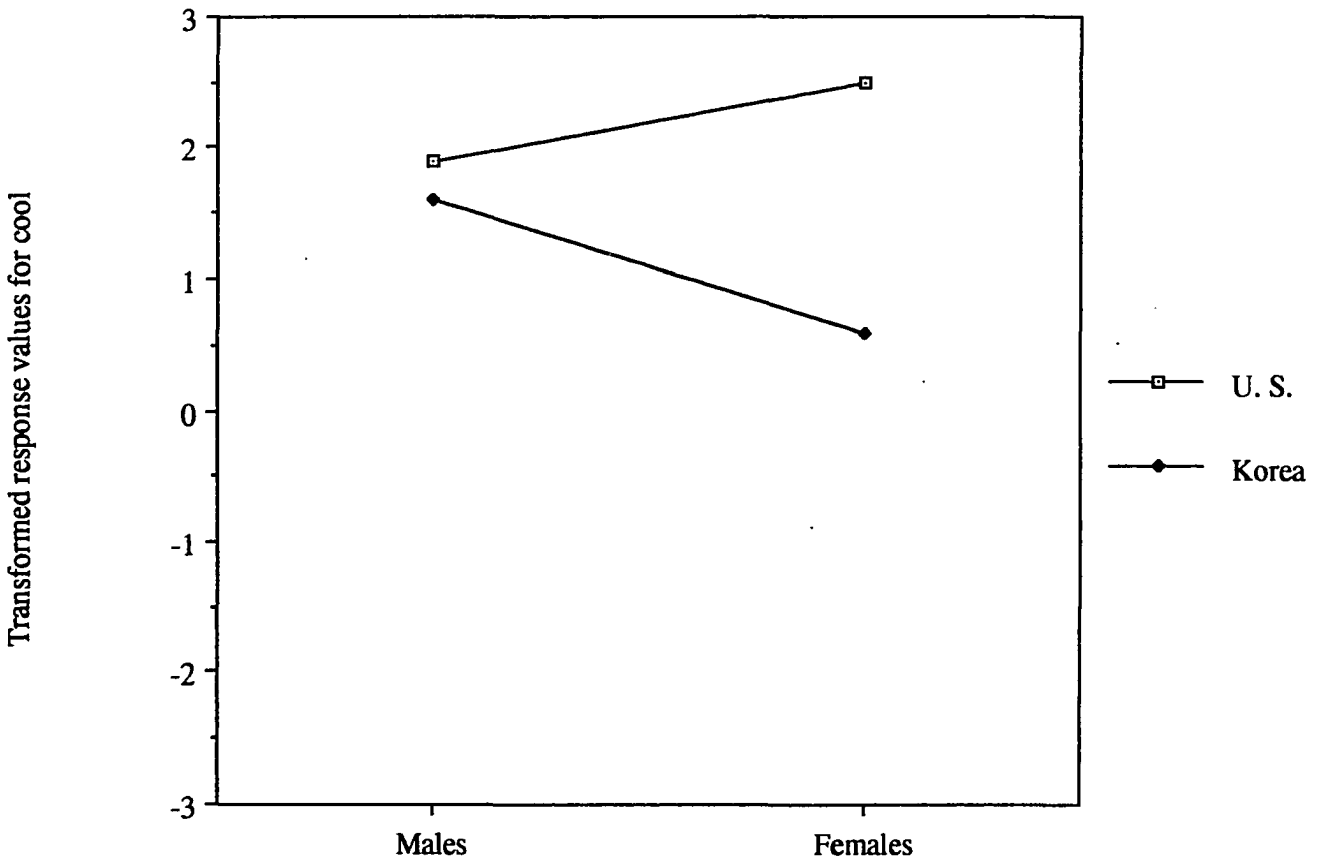

Figure 11. Means for interaction of country by sex for cool

Preferences For item 19, the interaction for country by sex was significant at the one percent level. However, the F-value for item 20 was not significant.

Table 20 lists means for the U. S. and Korean males and females for items 19 and 20

Table 19. Means of U. S. and Korean males and females for adjectives across fabrics; adjectives having significant F-values for the country by sex interaction

Adjective	U. S.		Korea	
	Males	Females	Males	Females
Smooth	0.7	1.8	-0.5	-0.5
Soft	1.0	1.7	1.0	0.9
Cool	1.9	2.5	1.6	0.6
Loose	1.7	1.9	0.8	-0.1
Flowing	1.1	1.4	1.4	0.3
Harsh	-1.2	-2.8	0.3	0.1

Table 20. Means of U. S. and Korean males and females for items 19 and 20 across fabrics

Country	Item 19		Item 20	
	Males	Females	Males	Females
U. S.	-0.9	1.7	0.8	-0.3
Korea	-0.5	0.4	0.7	-0.5

across all fabrics. U. S. and Korean males did not prefer the fabrics for shirts for themselves; U. S. females preferred the fabrics for shirts for themselves but Korean females were uncertain.

Sex by country by fabric The interaction of sex by country by fabric examined differences in the way males and females from the two countries responded to the unipolar adjectives and preference items for each of the seven fabrics. The interaction of sex by country by fabric was used partially to test sex and culture differences.

Adjectives The F-values for interaction of sex by country by fabric were significant for 7 of the 18 adjectives. The biggest F-value for this interaction was for sheer. Appendix K lists means for interaction of sex by country by fabric.

Figure 12 shows means for interaction of sex by country by fabric for sheer; Table K-1 (Appendix K) lists these means. Responses to fabrics B and G were similar in that Korean males and females were more certain than U. S. males and females were that fabrics B and G were sheer. U. S. males and females were uncertain about sheerness of fabric B; U. S females were more certain than U. S. males were that fabric G was sheer. U. S. and Korean judges were certain that fabric C was sheer, although U. S. females were more certain than Korean judges were that fabric C was sheer. Korean males were more certain than the others that fabric D was sheer.

Only U. S. males described fabric E as sheer; the other groups described fabric E as not sheer. All groups of judges were certain that fabrics A and F were not sheer. U. S. females were more certain than the other groups that fabric F was not sheer.

Both sexes from the same country tended to respond similarly to sheer for six of the seven fabrics. However, U. S. females seemed to be more certain of their responses than U. S. males were to sheer in both sheer and less sheer fabrics. Korean males seemed to be more certain than Korean females about sheerness of sheer fabrics.

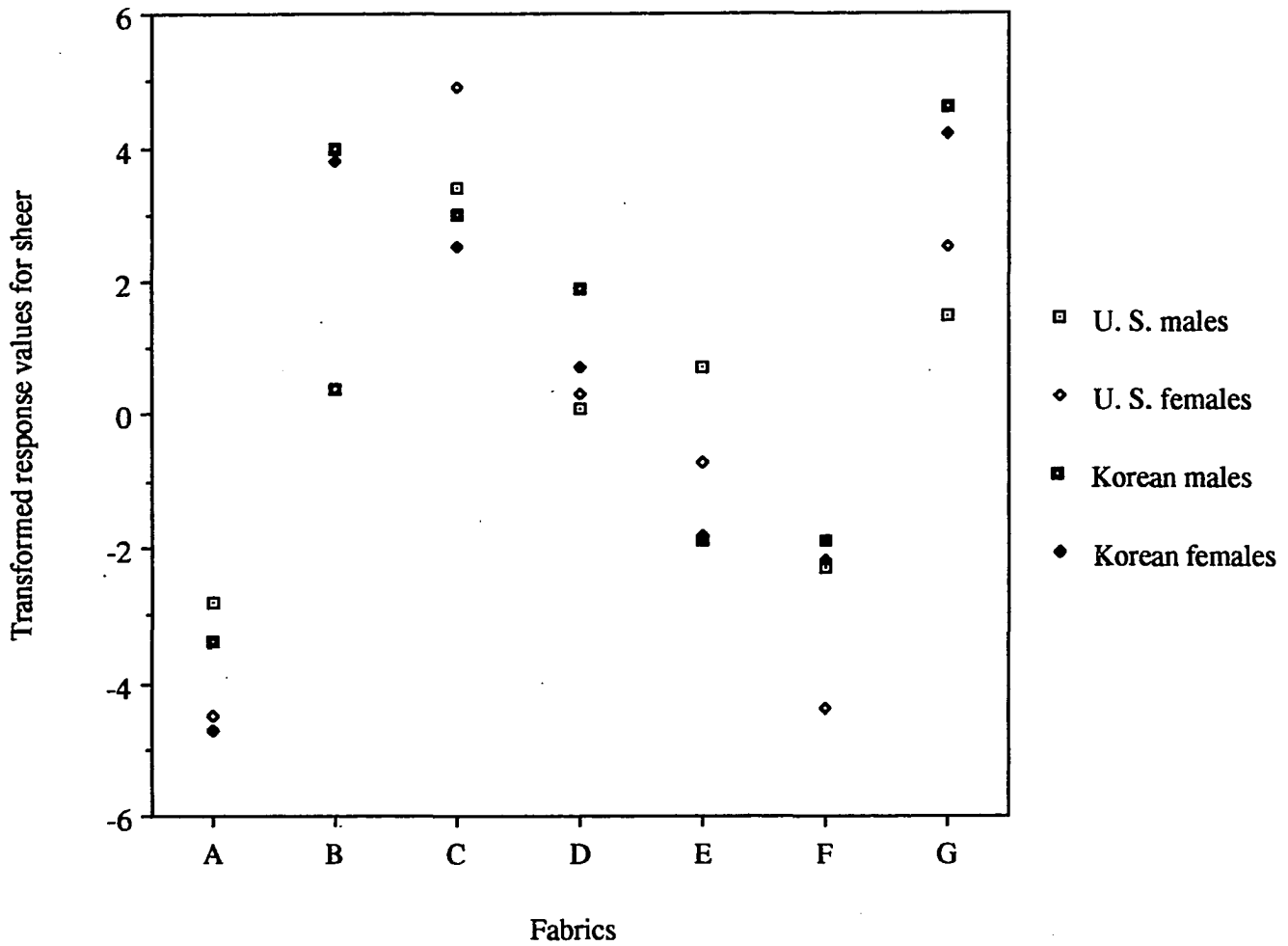

Figure 12. Means for sex by country by fabric for sheer

Figure 13 plots means for interaction of sex by country by fabric for cool; Table K-2 lists these means. All judges classified fabrics B, C, D, and G as cool; Korean judges were more certain than U. S. judges were that fabric B was cool, while it was the reverse for fabric C. Korean judges were certain that fabrics A and F were not cool; U. S. females described fabrics A and F as cool, but U. S. males were uncertain. U. S. judges described fabric E, a balanced taffeta with a brushed surface, as cool, while Korean judges described it as not cool. Generally females were more certain than males were about their opinions for cool for four of the seven fabrics. The two sexes from the same country tended to respond similarly to cool for five of the seven fabrics.

As mentioned, based on the researcher's observations, Koreans tend to regard crash as a cool fabric suitable for summer wear. In addition, there may be country differences related to environmental conditions; generally indoor heating and cooling conditions in the U. S. are better than those of Korea. Air conditioning is more widespread in the U. S. than in Korea. This may be why the U. S. respondents tended to perceive that four of the seven fabrics were cool.

Figure 14 shows means for interaction of sex by country by fabric for stiff; Table K-3 lists these means. All types of judges were certain that fabrics B and F were stiff and that fabrics C, D, and E were not stiff; U. S. females had larger means (absolute value) than U. S. males did for these fabrics and Korean females had larger means (absolute value) than Korean males did for fabrics C, D, E, and F. For fabrics A and G, U. S. males and females described them as not stiff; Korean males described fabric A as not stiff, but Korean females were uncertain; Korean males described fabric G as stiff, but Korean females described it as not stiff.

Figure 15 plots means for interaction of sex by country by fabric for absorbent; Table K-4 lists these means. All judges were certain that fabric F was absorbent, while all judges

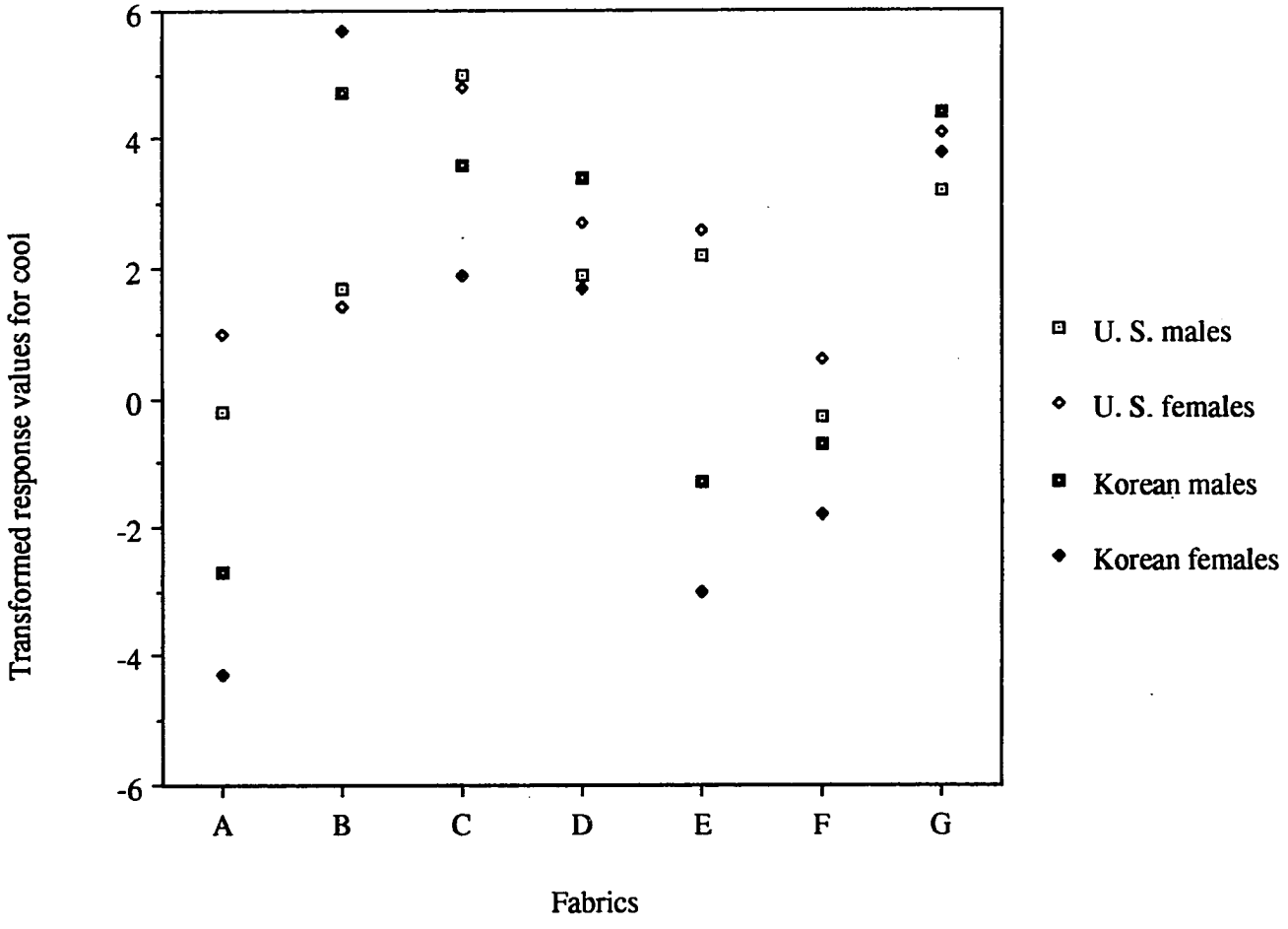

Figure 13. Means for sex by country by fabric for cool

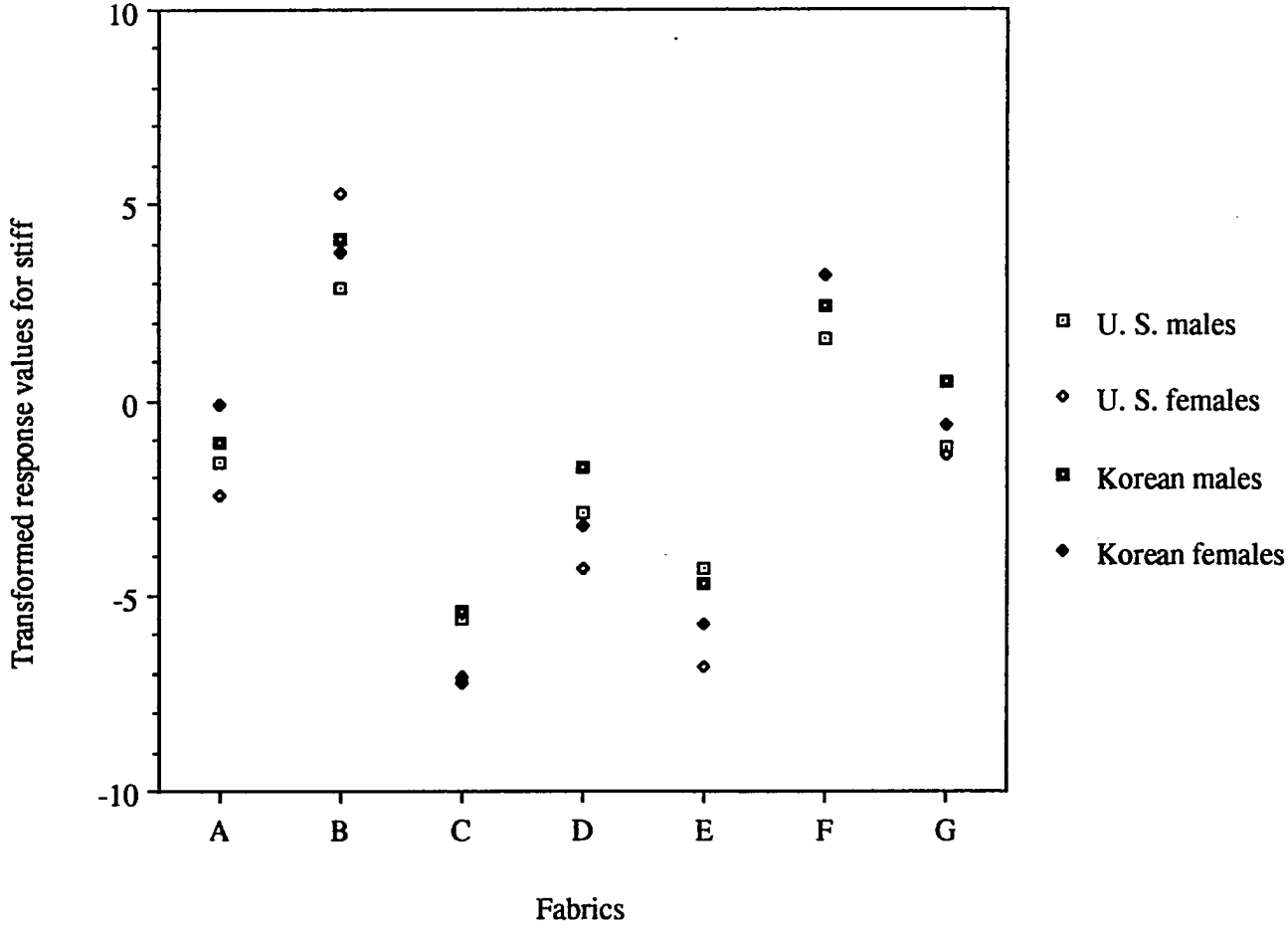

Figure 14. Means for sex by country by fabric for stiff

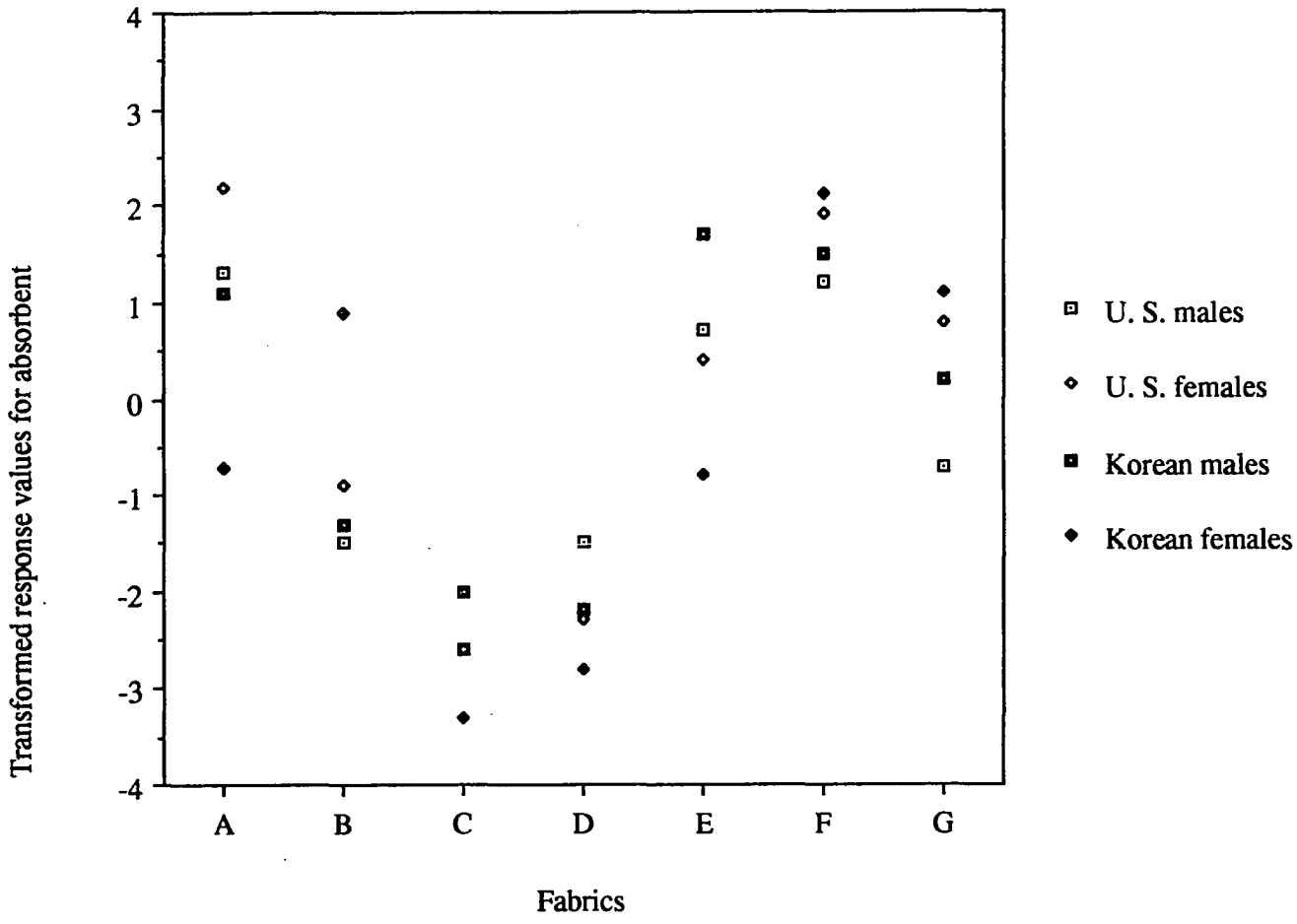

Figure 15. Means for sex by country by fabric for absorbent

were certain that fabrics C and D were not absorbent. Males described fabrics A and E as absorbent; Korean females described the fabrics as not absorbent and U. S. females were uncertain that fabric E was absorbent. There were greatly different responses to absorbent for fabric A between U. S. and Korean females and for fabric E between Korean males and females. Only Korean females described fabric B as absorbent; the other groups described fabric B as not absorbent. For all fabrics, Korean females either disagreed with the other groups about absorbent or, if they agreed, were more certain of their responses.

Figure 16 shows the interaction of sex by country by fabric for expensive; Table K-5 lists these means. All judges agreed that fabrics C and E were expensive; U. S. females were more certain than Korean females were that fabrics C and E were expensive. However, U. S. and Korean males had similar responses to expensive for these fabrics. Both U. S. and Korean judges were certain that fabric F was not expensive; Korean judges were more certain than U. S. judges were. Only Korean females described fabric G as expensive; U. S. and Korean males described this as not expensive, but U. S. females were uncertain. Korean females were uncertain that fabric B was expensive; the other groups described fabric B as not expensive. Females from the two countries showed greater disagreement than males from the two countries did for all fabrics.

The retail prices per yard for the seven fabrics were, in descending order, the following: $14.98 for fabric E; $8.98 each for fabrics D and G; about $7.50 for fabric B; $6.99 each for fabrics A and F; and $6.49 for fabric C. Only fabric B was purchased in Korea. Overall, none of the groups of judges did well in identifying expensiveness of the fabrics. Although fabric C was the lowest in price among the seven fabrics, fabric C was perceived as the most expensive fabric, perhaps because the respondents tended to think that fabric C was silk. U. S. females perceived fabric C as more expensive than the other groups did. All judges preferred fabric C for females and did not prefer it for males. Therefore, these

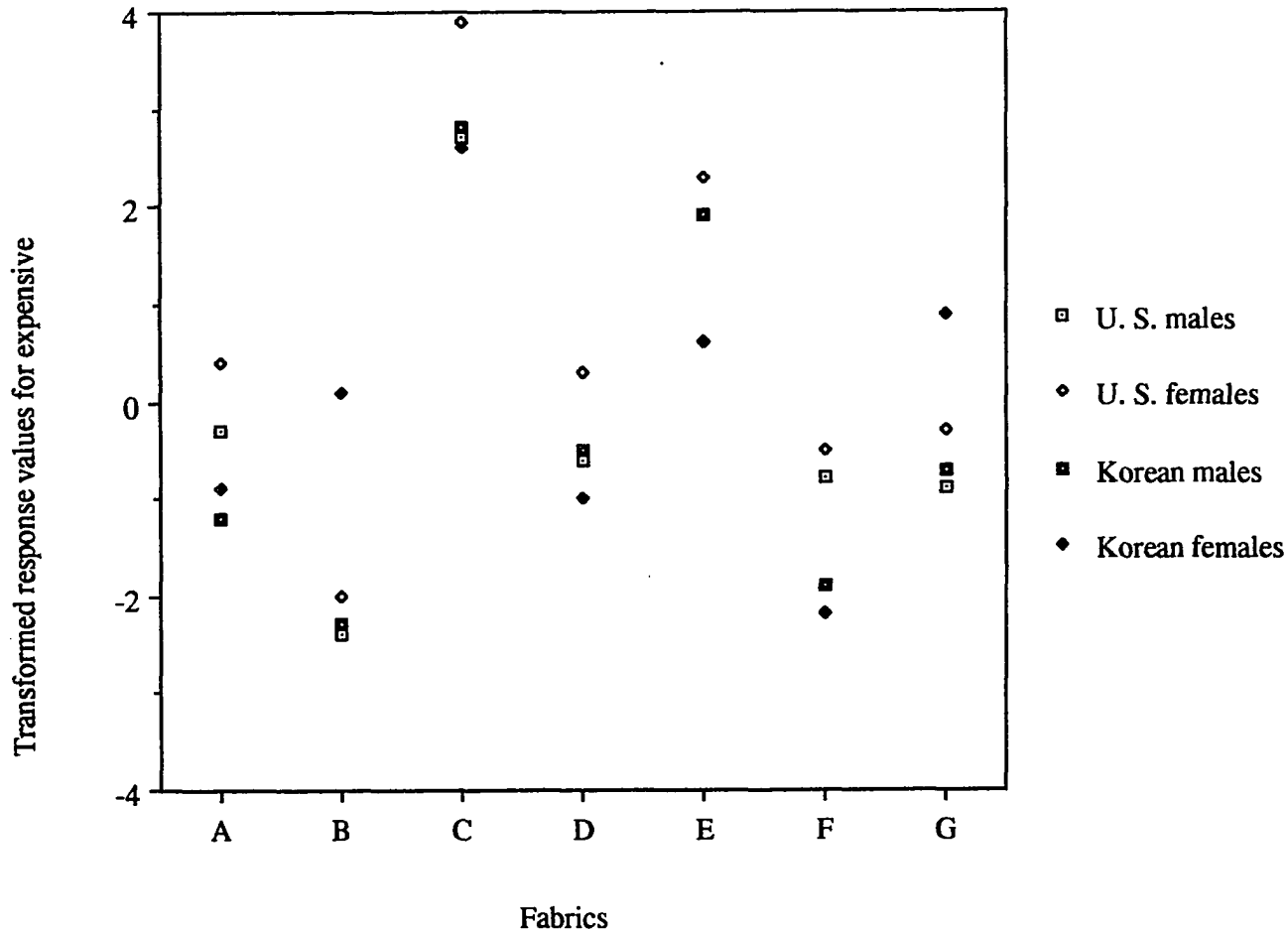

Figure 16. Means for sex by country by fabric for expensive

data did not show support for the pattern found by Lubner-Rupert and Winakor (1985). They found that males judged women's dresses to be more expensive than females did; females thought men's suits were more expensive than men did. U. S. females were more certain than U. S. males were that fabric C was expensive. As discussed next, on no other fabric was there complete certainty about suitability of the fabric for one sex or the other.

Preferences For items 19 and 20, the interactions for country by sex by fabric were significant at the one percent level. The F-value for item 19 was bigger than the value for item 20.

Table 21 lists means for U. S. and Korean males and females for each of seven fabrics for items 19 and 20; Figure 17 shows the interaction for sex by country by fabric for

Table 21. Means of U. S. and Korean males and females for each of seven fabrics for items 19 and 20

Fabric	Item 19				Item 20			
	U. S.		Korea		U. S.		Korea	
	Males	Females	Males	Females	Males	Females	Males	Females
A	2.1	2.3	-0.9	-0.5	0.7	3.3	-1.6	0.5
B	-3.5	-3.2	-0.3	1.5	-3.1	-2.1	0.0	2.3
C	-2.1	5.6	-1.9	2.0	4.5	-1.7	3.2	-4.4
D	-3.4	0.4	-1.8	-1.3	-0.0	-4.9	1.2	-3.7
E	0.6	4.3	1.2	-0.0	3.8	1.0	2.4	-2.2
F	1.6	0.9	-0.1	-0.2	-0.3	2.9	-1.3	1.1
G	-1.7	2.0	0.3	1.4	0.4	-0.4	1.0	3.0

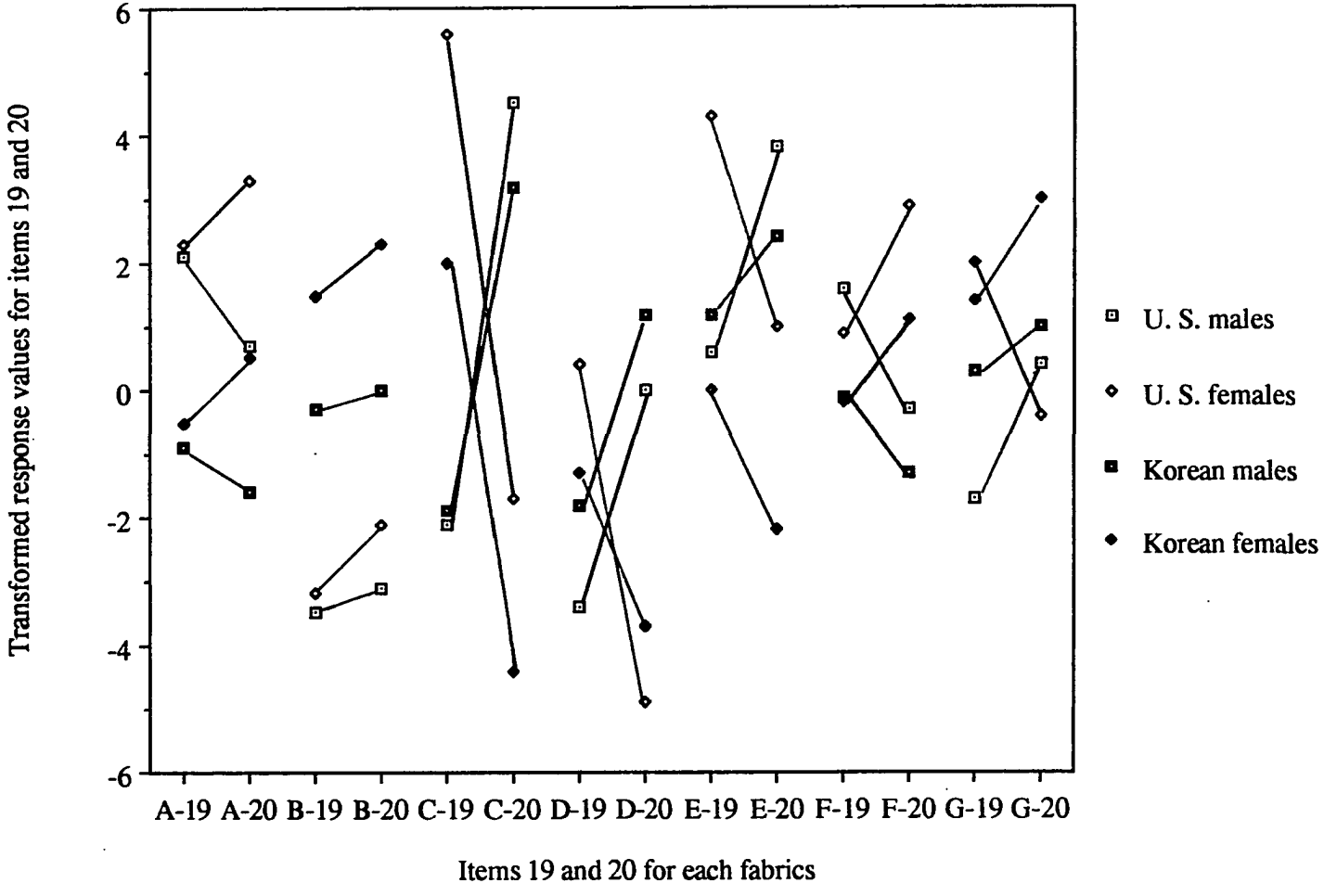

Figure 17. Means for sex by country by fabric for items 19 and 20

preferences. As shown in Figure 17, trends in preferences were consistent for fabrics A, C, D, E, and F; the slopes for males were in one direction and those for females in the other direction. For fabric B, slopes of males and females were in the same direction. For fabric G, the slopes of males and Korean females were in the same direction, but the slope of U. S. females was in the opposite direction.

Although the preferences for fabrics C, D and E differed among the various groups of judges, the trends (directions of plot) were consistent. As shown in Figure 17, females tended to prefer the fabrics more for themselves than for males, and the males agreed. Only for fabric C, which was a flat crepe, was there complete agreement across both sexes and both countries; U. S. and Korean males and females preferred it for females. U. S. and Korean males and females did not prefer fabric D for males; Korean females did not prefer it for themselves, but Korean males preferred it for females. U. S. males and females were uncertain about fabric D for females. U. S. males and females preferred fabric E for themselves and for the other sex; Korean males preferred fabric E for themselves and for females, but Korean females did not prefer it for males and were uncertain for themselves.

Neither Korean males nor females preferred fabric A for themselves; Korean females preferred fabric A for males, but Korean males did not prefer it for females. U. S. males and females preferred fabric F for themselves, while Korean males and females were uncertain. U. S. and Korean females preferred fabric F for males; Korean males did not prefer fabric F for females, but U. S. males were uncertain for females. According to Figure 17, the directions of plots for the fabrics A and F were the same; males preferred these fabrics more for themselves than for females; females also preferred these fabrics more for males than for themselves.

Korean females preferred fabrics B and G for themselves and for males. Korean males were uncertain about fabrics B and G for themselves; Korean males preferred fabric G for

females, but they were uncertain about fabric B for females. U. S. males and females did not prefer fabric B for themselves or for the other sex. U. S. males did not prefer fabric G for themselves and were uncertain for females; U. S. females preferred fabric G for themselves, but were uncertain for males. As shown in Figure 17, for fabric B, all judges preferred this fabric more for the other sex than for themselves. However, this trend was not true for the U. S. female group for fabric G. U. S. females preferred fabric G more for themselves than for males.

Based on these trends, the seven fabrics could be divided into four groups; 1) fabrics A and F, 2) fabrics C, D, and E, 3) fabric B, and 4) fabric G. Fabrics A and F were seen as suitable for men's shirts and fabrics C, D, and E were for females' shirts.

Analyses of Variance using Subsamples

Because there were differences in variances for the groups, the data were also analyzed separately by sex with country as a variable and by country with sex as a variable to see if differences in variances had any major impacts on findings. As mentioned, Manikowske and Winakor (1991), Horne (1991), and Winakor, Canton, and Wolins (1980) also analyzed their data separately. The models for the analyses using subsamples by sex and country are the following:

The model using the subsample by sex is:

$$Y_{ijl} = \mu + C_i + F_j + CF_{ij} + \varepsilon_{il} + \varepsilon_{ijl}$$

F = fabric, j = A, B, C, D, E, F, or G

C = country, i = U. S. or Korea

ε_{il} = error term for country; respondents within country

ε_{ijl} = error term for fabrics and interaction of fabric by country

The model using the subsample by country is:

$$Y_{jkl} = \mu + F_j + S_k + F S_{jk} + \varepsilon_{jl} + \varepsilon_{jkl}$$

F = fabric, j = A, B, C, D, E, F, or G

S = sex, *k*= male, female

ε_{kl} = error term for sex; respondents within sex

ε_{jkl} = error term for fabrics and interaction of fabric by sex

Subsample by males and females: comparisons of the two cultures

Analyses of variances using the male and female subsamples include two main effects for fabric and country and the interaction of fabric by country. The main effect for country and the interaction of fabric by country were used in part to test the hypothesis concerning country differences. Tables 22 and 23 list the F-values and their significances for each of 20 items using male and female subsamples. The F-values for fabric were significant and very large for all 20 items, like the F-values using the total sample.

Table 24 compares significance of F-values for the total sample and subsample by sex for the main effect of country. As shown in Table 24, responses of females were significant for more items for country than responses of males were. The females had four more significant F-values at the one percent level than the males had. This reflects the fact that females from the two countries had greater disagreement than males from the two countries did. Numerical differences between U. S. and Korean females were greater than those for males for 16 of 20 items (Table 25).

The adjective durable was significant for the total sample at the one percent level, while this word was significant for the subsamples by sex at the five percent level; U. S. respondents

Table 22. F-values for analysis of variance of transformed responses using male subsample for 20 items

Item	Fabric	Country	F x C
Heavy	136.82**	7.45**	1.20
Smooth	128.85**	18.58**	2.49*
Stiff	152.98**	8.64**	1.70
Absorbent	29.55**	1.18	1.14
Even	78.47**	0.83	1.28
Expensive	48.97**	0.68	1.10
Shiny	55.16**	7.35**	3.42**
Soft	172.73**	0.02	4.44**
Flexible	147.09**	9.10**	3.26**
Cool	79.94**	1.10	21.34**
Loose	30.92**	9.37**	2.93**
Flowing	76.47**	0.88	1.99
Strong	48.35**	24.08**	1.13
Fuzzy	38.97**	2.60	5.51**
Harsh	89.34**	23.68**	1.04
Sheer	90.22**	6.30*	17.51**
Durable	38.19**	6.78*	4.40**
Thick	122.40**	0.00	1.98
Item 19	22.66**	1.10	11.73**
Item 20	40.13**	0.11	9.02**

* $p \leq 0.05$

** $p \leq 0.01$

Table 23. F-values for analysis of variance of transformed responses using female subsample for 20 items

Item	Fabric	Country	F x C
Heavy	167.04**	11.26**	5.61**
Smooth	119.11**	47.00**	4.29**
Stiff	235.80**	7.93**	4.19**
Absorbent	42.97**	1.69	6.72**
Even	55.25**	0.00	1.40
Expensive	27.95**	3.52	6.58**
Shiny	64.11**	8.87**	2.23*
Soft	221.10**	8.80**	7.33**
Flexible	178.82**	12.88**	7.02**
Cool	66.09**	37.81**	36.04**
Loose	44.35**	32.13**	1.62
Flowing	188.28**	13.23**	1.99
Strong	50.03**	14.11**	0.67
Fuzzy	72.87**	9.10**	1.53
Harsh	133.90**	101.77**	7.03**
Sheer	126.95**	2.65	12.63**
Durable	49.42**	5.91*	1.99
Thick	146.49**	0.38	2.26*
Item 19	18.16**	13.86**	15.54**
Item 20	51.39**	0.35	21.32**

* $p \leq 0.05$

** $p \leq 0.01$

Table 24. Comparison of the significances of total sample and subsamples by sex for the main effect of country

Item	Total sample	Subsample by sex	
		Male	Female
Heavy	**	**	**
Smooth	**	**	**
Stiff	**	**	**
Absorbent			
Even			
Expensive			
Shiny	**	**	**
Soft	*		**
Flexible	**	**	**
Cool	**		**
Loose	**	**	**
Flowing			**
Strong	**	**	**
Fuzzy	**		**
Harsh	**	**	**
Sheer	**	*	
Durable	**	*	*
Thick			
Item 19			**
Item 20			

* $p \leq 0.05$

** $p \leq 0.01$

were more certain than Koreans were that the fabrics were durable. The biggest F-values for the total sample and the female subsample were for harsh; the two biggest F-values for the male subsample were for strong and harsh. As mentioned, this showed that these words might not have the same meanings as the Korean words used to express these concepts.

One interesting response to fabric hand was for sheer. The F-values for sheer were significant for the total sample and the male subsample; however, the F-value for sheer was not significant for the female subsample. As shown in Table 25, only Korean males were certain that the average of fabrics was sheer. This was the reverse of the responses of the U. S. group because, as discussed in the interaction of sex by country by fabric, U. S. females were more certain than U. S. males were that the fabrics were sheer. Sheerness of fabric may relate to modesty of clothing. Because modesty is socially learned (Kaiser, 1990), standards of modesty vary from one culture to another. Culture differences might affect perception of sheerness. Generally, Korean culture, which was affected by Confucianism, has avoided exposure of the body. In addition, Korean males tend to think more conservatively than Korean females do about clothing modesty.

The F-value for item 19 was significant only for the female subsample. U. S. females preferred the average of the seven fabrics for themselves, while Korean females were uncertain. However, the males from the two countries did not prefer the average of the seven fabrics for themselves.

Table 26 compares significance of F-values for the total sample and subsamples by sex for the interaction of country by fabric. The responses of females were significant for country by fabric for more words than the responses of males were. The females had four more significant F-values at the one percent level than the males had. This pattern also reflects that females from the two countries had greater disagreement than males from the two countries did. The highest F-value was for cool for all three groups.

Table 25. Means of U. S. and Korean males and females across the seven fabrics

Item	U. S.		Korea	
	Males	Females	Males	Females
Heavy	-0.50	-1.54	-1.27	-2.56
Smooth	0.74	1.77	-0.48	-0.51
Stiff	-1.58	-2.06	-0.83	-1.37
Absorbent	-0.46	-0.09	-0.15	-0.52
Even	1.28	1.84	1.02	1.82
Expensive	-0.05	0.58	-0.29	0.01
Shiny	-1.69	-3.01	-0.72	-1.79
Soft	0.99	1.69	1.02	0.90
Flexible	2.52	2.74	1.70	1.57
Cool	1.92	2.45	1.64	0.57
Loose	1.71	1.90	0.81	-0.09
Flowing	1.07	1.42	1.35	0.27
Strong	1.64	1.27	0.21	-0.02
Fuzzy	-2.41	-4.18	-1.86	-2.94
Harsh	-1.16	-2.76	0.31	0.12
Sheer	0.16	-0.22	0.89	0.36
Durable	1.39	1.46	0.68	0.71
Thick	-0.54	-1.92	-0.53	-1.72
Item 19	-0.90	1.72	-0.49	0.39
Item 20	0.84	-0.27	0.71	-0.50

Table 26. Comparison of the significances of total sample and subsamples by sex for the interaction of country by fabric

Item	Total sample	Subsample by sex	
		Male	Female
Heavy	**		**
Smooth	**	*	**
Stiff	*		**
Absorbent	**		**
Even	*		
Expensive	**		**
Shiny	**	**	*
Soft	**	**	**
Flexible	**	**	**
Cool	**	**	**
Loose	**	**	
Flowing	*		
Strong			
Fuzzy	**	**	
Harsh	**		**
Sheer	**	**	**
Durable	**	**	
Thick	*		*
Item 19	**	**	**
Item 20	**	**	**

* $p \leq 0.05$

** $p \leq 0.01$

For smooth, the F-values for the total sample and the female subsample were significant at the one percent level, while the F-value for the males was significant at the five percent level. For shiny, the F-values for the total sample and the male subsample were significant at the one percent level, while the F-value for the female subsample was significant at the five percent level.

For heavy, stiff, absorbent, expensive, harsh, and thick, the F-values for the total sample and the female subsample were significant. However, the F-values for the male subsample were not significant for these words. As shown in Figures 14, 15, and 16, the males from the two countries tended to respond similarly to these adjectives. This indicates that females were more certain than the males were that these adjectives describe the fabrics.

However, for loose, fuzzy, and durable, the F-values for the total sample and the male subsample were significant; the F-values for the female subsample were not significant. U. S. males were more certain than Korean males were about durable for six of the seven fabrics; Korean males were close to zero on the scale. In the focus group interviews, Korean males did not state fiber content and fabric names, as compared with the other groups. In addition, they mentioned that they usually did not buy clothing for themselves; somebody, generally their mothers, selected clothing for them. However, U. S. males responded positively to the question "When you select clothing and textiles in the store, what kinds of fabric hand do you prefer?" Based on the information in the focus group interviews, the degree of concern and knowledge about fabrics was different for Korean and U. S. male students. Perhaps this showed in the different responses to durable between U. S. and Korean males.

The F-value for flowing was significant at the five percent level for the total sample; however, it was not significant for the subsamples by sex.

Subsample by country: comparisons of the sexes

Analyses of variance using U. S. and Korean subsamples include two main effects for fabric and sex and the interaction of fabric by sex. The main effect for sex and the interaction of fabric by sex were used in part to test the hypothesis concerning sex differences. Tables 27 and 28 list the F-values and their significances for each of 20 items using U. S. and Korean subsamples. The F-values for fabric were significant and very large for all 20 items, as were the F-values using the total sample.

Table 29 compares significance of F-values for the total sample and subsample by country for the main effect of sex. The F-values for the 20 items varied in the three groups. Only five of the 20 items were significant at the one percent level for all three groups. There seemed to be little difference between the two countries in terms of number of items that were significant.

The biggest F-values for the total sample and the subsamples by country were for thick. The females from the two countries were more certain than the males from the two countries were that the seven fabrics as a whole were not thick (see Table 25). According to Table 25, Korean responses were more extreme for five of the 20 items for males and for four of the items for females, while U. S. responses were more extreme for 14 of the 20 items for males and for 16 of the items for females.

For smooth, expensive, and harsh, the F-values for the total sample and the U. S. subsample were significant, while the F-values for these words were not significant for the Korean subsample. U. S. females were more certain than U. S. males were that the fabrics were smooth and expensive, but not harsh.

The F-values for stiff and even were significant for the total sample (at the one percent level) and Korean subsample (at the five percent level) ; however, the F-values for these

Table 27. F-values for analysis of variance of transformed responses using U. S. subsample for 20 items

Item	Fabric	Sex	F x S
Heavy	144.83**	12.09**	2.09
Smooth	133.79**	11.96**	1.21
Stiff	219.88**	3.37	9.79**
Absorbent	44.83**	1.64	2.37*
Even	75.32**	3.30	1.48
Expensive	54.37**	5.44*	0.44
Shiny	74.36**	11.33**	2.94**
Soft	227.20**	7.40**	3.19**
Flexible	136.34**	0.43	2.96**
Cool	41.29**	3.05	1.17
Loose	53.58**	0.35	2.23*
Flowing	179.93**	1.68	18.01**
Strong	55.48**	2.08	0.28
Fuzzy	50.42**	19.89**	4.13**
Harsh	149.96**	28.51**	6.20**
Sheer	93.50**	1.44	5.93**
Durable	65.84**	0.06	1.18
Thick	126.01**	20.11**	4.04**
Item 19	40.61**	46.54**	19.09**
Item 20	40.58**	8.48**	31.50**

* $p \leq 0.05$

** $p \leq 0.01$

Table 28. F-values for analysis of variance of transformed responses using Korean subsample for 20 items

Item	Fabric	Sex	F x S
Heavy	159.93**	19.84**	3.08**
Smooth	117.65**	0.01	2.73*
Stiff	174.52**	4.96*	3.35**
Absorbent	28.28**	1.29	7.03**
Even	57.17**	5.26*	1.30
Expensive	28.17**	0.90	4.35**
Shiny	49.20**	8.09**	0.67
Soft	183.02**	0.25	3.39**
Flexible	194.98**	0.30	4.34**
Cool	155.63**	16.16**	3.48**
Loose	29.10**	7.48**	0.94
Flowing	96.59**	9.51**	8.22**
Strong	44.34**	0.40	2.36*
Fuzzy	61.86**	8.96**	1.12
Harsh	89.09**	0.41	1.80
Sheer	153.95**	2.55	0.95
Durable	29.99**	0.01	1.20
Thick	142.77**	20.43**	0.76
Item 19	5.80**	5.29*	5.22**
Item 20	10.92**	11.17**	41.53**

* $p \leq 0.05$

** $p \leq 0.01$

Table 29. Comparison of the significances of total sample and subsamples by country for the main effect of sex

Item	Total sample	Subsample by country	
		U. S.	Korea
Heavy	**	**	**
Smooth	*	**	
Stiff	**		*
Absorbent			
Even	**		*
Expensive	*	*	
Shiny	**	**	**
Soft		**	
Flexible			
Cool			**
Loose			**
Flowing			**
Strong			
Fuzzy	**	**	**
Harsh	**	**	
Sheer	*		
Durable			
Thick	**	**	**
Item 19	**	**	*
Item 20	**	**	**

* $p \leq 0.05$

** $p \leq 0.01$

words were not significant for U. S. subsample. Korean females were more certain than Korean males were that the fabrics were even but not stiff.

The F-values cool, loose, and flowing were significant only for the Korean subsample. As shown in Table 25, Korean males were more certain than Korean females were that the average of the fabrics was cool, loose, and flowing. However, if each fabric is considered (see Figure 13), Korean females were more certain than Korean males were about their opinions for cool for four of the seven fabrics. The F-value for soft was significant only for the U. S. subsample. U. S. females were more certain than U. S. males were that the average of the seven fabrics was soft.

Table 30 compares significances of F-values for the total sample and the subsamples by country for the interaction of sex by fabric. The F-values for the 20 items also varied in the three groups. Only six of the 20 items were significant at the one percent level for all three groups. As shown in Table 30, only four of the adjectives were highly significant for both countries, which strongly suggested considerable cultural and language differences. The highest F-values were for item 20 for the total sample and the subsamples by country.

For heavy, stiff, and expensive, the F-values for the total sample and the Korean subsample were significant; the F-values for the U. S. subsample were not significant for these words. For cool and strong, the F-values were significant only for the Korean subsample. As shown in Figure 13, Korean males were more certain than Korean females were that fabrics C and D were cool. Korean females were more certain than Korean males that fabric B was cool. Korean females were more certain than Korean males were that fabrics A, E, and F were not cool. For fabric G, all judges responded similarly. Although fabrics C and D, which were crepes, were actually not cool fabrics based on the researcher's judgment, Korean males described these fabrics as very cool. This suggests that Korean males may guess about coolness of fabrics.

Table 30.

Item
Heavy
Smooth
Stiff
Absorben
Even
Expensive
Shiny
Soft
Flexible
Cool
Loose
Flowing
Strong
Fuzzy
Harsh
Sheer
Durable
Thick
Item 19
Item 20

* $p \leq 0.$

** $p \leq 0$

Table 30. Comparison of the significances of total sample and subsamples by country for the interaction of sex by fabric

Item	Total sample	Subsample by country	
		U. S.	Korea
Heavy	*		**
Smooth	**		*
Stiff	**	**	**
Absorbent	**	*	**
Even	*		
Expensive	*		**
Shiny		**	
Soft	**	**	**
Flexible	**	**	**
Cool			**
Loose	*	*	
Flowing	**	**	**
Strong			*
Fuzzy	**	**	
Harsh	**	**	
Sheer	**	**	
Durable			
Thick	**	**	
Item 19	**	**	**
Item 20	**	**	**

* $p \leq 0.05$

** $p \leq 0.01$

The F-value for thick was significant for the total sample and U. S. subsample. U. S. females were more certain than U. S. males were that fabrics C, D, E, and G were not thick. U. S. males and females responded similarly for the other fabrics. The F-value for shiny was significant only for the U. S. sample. U. S. females were more certain than U. S. males were that fabrics were shiny or not shiny.

Summary

The analysis of data separately by sex and by country revealed a few differences in details, as compared with the analysis of all data together. However, no major new conclusions resulted from the analysis of data by subsamples. Therefore, for these data, the differences in variances seem to have no important impact on the outcome of the analysis of variance. Further, the analysis using the subsamples largely reinforced and clarified the results from the analysis using the overall sample. The subsample by country and sex showed that there were differences between males and females as well as between Korean and U. S. groups. This may be further evidence of sex and cultural differences for fabric hand research and for responses to affective items in general.

CHAPTER V. DISCUSSION AND CONCLUSIONS

This chapter discusses the findings of the data analysis. Because each effect in analysis of variance including main effects and interactions was used to examine the hypotheses, a comprehensive discussion of the findings was needed to reach conclusions. In addition to the hypotheses, this section also discusses other findings and limitations of the present research.

Interpretation of Results

Hypothesis 1

The first hypothesis was that U. S. and Korean consumers do not differ in their responses to fabric hand. The hypothesis was tested by examining the country effect and the interaction of country by fabric in the analysis of variance for the 18 adjectives.

A critical point in investigating cultural differences in evaluation of fabric hand between the U. S. consumers and Korean consumers was differentiating between whether the adjectives were equivalent in meaning for English and Korean languages or whether fabric hand perceptions differed in the U. S. and Korean cultures. Yuan (1990) found meaning differences between Chinese and English even though two words were regarded as equivalent in the two languages.

The F-values for country across all fabrics were significant for 13 of the 18 adjectives (see Table 14). Therefore, nearly three-fourths of these words may have different meanings in English and Korean. The two largest F-values by far for country were for harsh and smooth. As Figure 6 shows, English speaking judges were certain that the fabrics were not harsh, while Korean speaking judges were uncertain. The researcher found no obvious explanation for this. Neither the opinions of the expert judges nor comments in the focus group interviews gave

indications of why this word might be interpreted differently. However, U. S. subjects in the focus group interviews used words such as as coarse or rough to describe the heavy denim sample rather than using the word harsh, while Korean subjects used *kokyulkokyulhan* (harsh) to describe the denim. This may imply that the meanings or uses for harsh differ between English and Korean. The F-value for harsh was also highly significant for country by sex; F-values were significant but moderate for the interactions of country by fabric, sex by fabric, and sex by country by fabric. The predominant effect for harsh was for the main effect for country across the seven fabrics.

The responses of English and Korean judges to smooth were in opposite directions, as shown in Figure 6. English speaking judges were very certain that the fabrics were smooth, while Korean judges were certain that the fabrics were not smooth. Based on the focus group interviews, the researcher proposed that Korean males did not differentiate "smoothness" from "softness" of fabrics. One Korean male described satin as "silky" because of its "softness." Korean males may have perceived smoothness as a compressibility characteristic rather than as a surface characteristic. In definitions of fabric hand, softness of fabric is generally related to compressibility, while smoothness of fabric is related to frictional texture. However, this topic did not come up in the Korean female focus group interview. Also, the interaction of sex by country by fabric was not significant.

Yuan (1990) found that the senses and use of "thin" ("xi" in Chinese) were different in the Chinese and English languages: the Chinese subjects ranked "a xi rope" as the most central and prototypical meaning and use of "xi", while the American subjects ranked "She is thin" as the most central and prototypical. Similarly, results of the present research suggest that Korean adjectives such as harsh and smooth have different central meanings as compared with the English adjectives.

The F-values for the two way interaction of country by fabric were significant for 17 of the 18 adjectives (see Table 16). This implies that there are possible cultural differences in interpretations of words as they apply to specific fabrics for almost all of the adjectives. For example, the largest F-value for country by fabric was for cool. Korean speaking judges were more certain than English speaking judges were that the two crash fabrics were cool. Based on the observations of the researcher, crash has been used traditionally for summer garments in Korea. In addition, Korean females in the focus group interview mentioned that they often chose crash fabrics for summer garments. The significance of the sex by country by fabric interaction for cool (see Table 16) supports this observation.

Although the F-value for sheer was the second largest in the interaction of country by fabric, there seemed to be no meaningful pattern in terms of the type of fabric. Cultural differences for sheerness were shown clearly in the three way interaction of sex by country by fabric. The F-value for sheer for sex by country by fabric was largest among the F-values for the 18 adjectives. The three-way interaction is discussed later in this chapter.

Some of the main effects for country may imply cultural differences and environmental differences between the two countries as well as language differences. The country effect for cool and sheer differed significantly between English and Korean judges (see Table 14). English speaking judges were more certain than Korean speaking judges were that the fabrics were cool. Fritz et al. (ca. 1987) reported that culture and climate affected preferences for fabric. Environmental conditions differ in the United States and Korea. Generally air conditioning is more widespread in the United States than in Korea. Therefore, concern with thermal comfort of fabric may differ between English speaking and Korean speaking judges. Korean judges were certain that the fabrics were sheer, while English speaking judges were uncertain, but the difference was not large.

The first hypothesis was rejected based on the evidence. First, even though there was difficulty in differentiating between language differences and cultural differences, generally the main effect for country seemed to indicate meaning differences between English and Korean. Some words such as harsh and smooth appear to have different meanings between English and Korean. Second, cultural differences were implied in the main effect for country as well as in the interaction of country by fabric. The responses to cool and sheer suggested cultural and environmental differences between the two countries.

Hypothesis 2

The second hypothesis was that male and female consumers do not differ in their responses to fabric hand. The hypothesis was tested by examining the main effect for sex and the interaction of sex by fabric in the analysis of variance.

Many researchers have shown that males and females differ in their responses to affective stimuli. In this research, the F-values for sex were significant for 10 of the 18 adjectives. The mean responses for females were significantly larger (absolute value) than the responses for males for nine of the ten adjectives significant for sex effect. The response pattern of males and females suggests that the females were more opinionated than the males were. Perhaps fabric hand is seen as the female's topic; part of the female role. Also, the females had larger standard deviations for all 18 adjectives across all fabrics; thus the females' responses were also more heterogeneous --more polarized-- than those of the males. The response pattern in this research paralleled those reported by Horne (1991), Manikowske and Winakor (1991), and Winakor, Canton, and Wolins (1980).

The F-values for sex by fabric were significant for 14 of the 18 adjectives (see Table 16). The means for this interaction also showed that the females were more certain about their responses than the males were. For example, for flowing, which had the largest F-value, the

females had larger means than the males did for five of the seven fabrics. Moreover, although the F-value for fuzzy was low, the responses to fuzzy clearly showed this pattern: the females had larger means (absolute value) than the males did for all seven fabrics.

The second hypothesis was rejected because there was evidence of sex differences for the responses to fabric hand. The females were more certain than the males were when they responded to affective stimuli. Although Bogaty et al. (1956) did not design their research to examine sex differences in evaluating fabric hand, they observed that men tended to judge harshness more severely on the average than women in evaluating fabric hand. But they found no significant difference. However, many researchers have shown that females responded more intensely to affective stimuli (Horne, 1991; Manikowske & Winakor, 1991; Winakor, Canton, & Wolins, 1980). In addition, Kipp (1980) found that responses to environmental comfort showed greater sensitivity among female college students than among males. In the present research, this pattern is also found for fabric hand using the total sample. Analysis using the subsamples by country showed the same pattern for the means; however, Korean females' standard deviations were about the same as those of Korean males.

Interaction of country by sex

The interaction of country by sex examined sex and culture differences across all fabrics. The F-values for country by sex were significant for 6 of the 18 adjectives (see Table 16). The three largest F-values were for cool, harsh, and flowing.

The general pattern for all significant adjectives was that the difference between responses of U. S. and Korean females was larger than the difference between U. S. and Korean males. This suggests that the responses of females in the two countries to fabric hand differ more in certainty than the responses of males do. The mean responses of U. S. females were larger (absolute value) than the mean responses of U. S. males were for all adjectives

significant for country by sex across all fabrics. However, this was not true for the Korean responses: Korean males were more certain than Korean females were for some words; the opposite was true for other words.

The interaction of country by sex suggests cultural differences between U. S. and Korean subjects. The pattern that females responded more intensely to affective stimuli was more consistent for the U. S. subjects than for the Korean subjects.

Interaction of sex by country by fabric

The interaction of sex by country by fabric examined differences in the way males and females from the two countries responded to the adjectives for each of the seven fabrics. The F-values for the interaction of sex by country by fabric were significant for 7 of the 18 adjectives. All F-values for this interaction were relatively low as compared with the F-values for the other interactions. The two biggest F-values for this interaction were for sheer and stiff.

As mentioned, generally the responses of judges were harmonious with the characteristics of the seven fabrics as measured by instruments. Judges described fabrics B, C, D, and G as sheer, while judges responded that fabrics A, E, and F were not sheer. Based on these judgments, fabrics B, C, D, and G can be placed in the sheer fabric category and fabrics A, E, and F can be classified as not sheer fabrics. As shown in Figure 13, Korean males and females were more certain than U. S. males and females were that the two crash fabrics, B and G, were sheer. For five of seven fabrics, the responses of U. S. subjects for sheer followed the pattern that females were more certain of their responses than males were for both sheer and less sheer fabrics. However, Korean males seemed to be more certain than Korean females about sheerness of the sheer fabrics, B, C, D, and G, although some of these differences were small.

According to Weon and Kahng (1983), Korean male college students were more conservative about modesty of clothing than Korean female college students were, although they suggested that Korean female college students who were older tended to be less conservative about modesty of clothing because they had positive attitudes toward liberal sex roles and fashion. Sheerness of fabric can be associated with modesty in clothing. Kaiser (1990) stated that standards of modesty differ among cultures because modesty is socially learned. Korean culture has avoided exposure of the body because Confucianism emphasizes conservative attitude in their life (A Handbook of Korea, 1979). In the present research, Korean males were more certain about sheerness of fabrics than Korean females were, while results were usually opposite for U. S. males and females. This supported sex and cultural differences in perception of modesty of clothing.

The responses to the other adjectives differed strongly by the type of fabric. However, for the words stiff and cool, the three-way interaction showed also that the responses of females seemed to be more certain than the responses of males were.

The three-way interaction of sex by country by fabric supported both sex and cultural differences. Cultural differences affect perception of sheerness. The responses to sheer, stiff, and cool suggested sex differences in that usually females were more certain than males were, but in some cases as for sheer, Korean males were more certain than Korean females were.

Hypothesis 3

The third hypothesis was that for a specific end use, consumers prefer the same fabrics for their own sex and for the other sex. The hypothesis was tested by examining items 19 and 20.

The seven fabrics were chosen to represent various shirting fabrics for men, women, and both. The means for the main effect for sex showed that the females across countries

preferred the average of the seven fabrics for shirts for themselves, while they were uncertain for males. The males across countries did not prefer the average of the seven fabrics for themselves, but they preferred the fabrics for females. Therefore, both males and females tended to prefer the fabrics for females. This effect may be partly due to fabric C, a flat crepe: the males and females strongly preferred fabric C for females but not for males. The means for sex by fabric for items 19 and 20 differed by the type of fabric. As mentioned, fabric C was the only fabric on which there was complete agreement across both sexes.

The means for the main effect for country showed that there was no country difference when consumers judged fabrics for shirts for themselves and for the other sex. However, the F-values for the two-way interaction of country by sex and for the three-way interaction of country by sex by fabric were significant.

As shown in Figure 17, only Korean females preferred fabric B, a linen crash, both for themselves and for males; Korean males were uncertain. However, neither U. S. males nor females preferred fabric B for themselves or for the other sex. Crash is a traditional fabric in Korea and is still used commonly for summer garments. U. S. males and females in the focus group interviews mentioned that the "easy to take care of" characteristic of fabrics is very important when they select clothing. On the other hand, Korean males and females in the focus group interviews did not mention this characteristic of fabric. Crash, especially linen, usually is not easy to care for.

On the contrary, U. S. males and females preferred fabrics A and F, which were twill and oxford respectively, for themselves, while Korean males and females did not prefer these for themselves or were uncertain. Twill and oxford may be associated with western style garments.

Fabric C, a flat crepe, was the only fabric that had complete agreement across both sexes and both countries; U. S. and Korean males and females preferred it for females but not

for males. However, U. S. females preferred fabric C more for themselves than Korean females did. Fabric C had the largest number of extreme responses of any fabric. For example, the respondents described fabric C as shiniest among the seven fabrics. In the focus group interviews, Korean females and U. S. females described satin as shiny. Korean females in the focus group interviews mentioned that they would not wear satin for outwear, while U. S. females would wear it for outwear. This supports cultural differences about preference for shiny fabrics. Fritz et al. (ca. 1987) reported that female Scottish and Australian judges differed in preference for fabrics for blouses or underslips. They found that Australian judges preferred lightweight cotton, dull styled crepe de chine, and soft, sensuous, or transparent fabrics for these end uses. However, the Scottish judges preferred heavy shirtings, shiny, and synthetic style fabrics. Therefore, the researchers concluded that culture and climate affected the preferences for fabrics. Anttila (1988) also stated that judges' previous experiences affected sensory evaluation of textile materials. In the present research, cultural differences seemed to contribute to preferences for fabrics.

The third hypothesis was rejected based on the evidence. First, the main effect for sex indicated that males and females differed in their preferences for the seven fabrics for themselves and for the other sex. Second, although the main effect for country was not significant, the interaction of country by fabric implied that the preferences for specific fabrics differed between U. S. and Korean subjects. Third, the three-way interaction of country by sex by fabric supported sex and cultural differences for preferences for the judges themselves and for the other sex. Differences among countries in preferences for fabric hand may be important to international manufacturers and retailers.

Summary

Hypotheses 1, 2, and 3 were each rejected not only on the basis of main effects but also on the basis of examination of the interactions and other information such as comments made during the focus group interviews.

Implications for Future Research

Development of comparable sets of unipolar adjectives for English and Korean

One objective of this research was to develop comparable or equivalent sets of unipolar adjectives for consumer evaluation of fabric hand for the United States and Korea. A critical point in this research was whether the instruments were equivalent in meaning for English and Korean judges.

Many English hand descriptors were found in previous research papers, but few Korean hand descriptors were found. In addition, no research was found eliciting Korean descriptors from consumers as well as from experts. Therefore, research can be designed to collect various Korean hand descriptors. Both written and spoken techniques are suggested to elicit various words. Chang (1986) suggested that there could be differences between descriptors offered by subjects when writing and speaking because speaking may elicit words more freely than writing. One assumption of the present research was that respondents can provide words describing hand of selected fabrics. Although Korean males had difficulty in describing fabric hand in the focus group interview, the other groups did well.

Many words seemed to be used differently in English and Korean. Although it was hard to differentiate language differences from cultural differences, the evidence in this research indicated that cultural differences can be differentiated partly from language differences. Yuan

(1990) found meaning differences between Chinese and English even though two words were regarded as equivalent in the two languages. She examined meaning differences only for thin. Therefore, research could be designed to examine central meanings for fundamental hand adjectives. For example, the words soft and flexible, which are used widely in hand research, describe the theoretical textile properties of compressibility and bending. For these words, a study could be designed to compare central meanings of English and Korean adjectives.

Unipolar adjectives rather than bipolar adjectives were used in this research to reduce the problem of matching antonyms in English and Korean. Because many hand adjectives differed in meaning between English and Korean, use of unipolar adjectives is recommended for further research. The 11-point scale functioned well with both U. S. and Korean groups.

Some adjectives such as absorbent and strong did not show clearly whether there were language differences or cultural differences in meaning. If various stimuli were selected specifically to represent these properties, results might reveal language differences or cultural differences more clearly.

The finding that females respond more intensely to textile stimuli suggests need for caution when researchers interpret results for male responses versus female responses. The present research indicated that this pattern differed by culture. For sheer, Korean males were more certain than Korean females. Lubner-Rupert and Winakor (1985) suggested that a larger panel size was needed for males than for females because the standard deviations of responses showed that males varied more in their responses than did women. However, the present research suggests this pattern may not be true for another culture because standard deviations and means of responses for males and females differed by culture.

Color and design effects

In the present research, judges could see and touch the fabrics. To avoid the possible influence of visual effects on the perception of fabric hand, assessment by touch alone has been used more often. However, it is unsuitable and artificial for consumer judges to judge hand by touching without seeing. In the present research, all white fabrics were chosen to avoid color effects. Chang (1986) used seeing and touching methods to describe both white and blue fabric samples. She suggested that the effect of light on the pile or napped fabrics in blue could affect judges' responses. Wauer (1965) also used both seeing and touching techniques using beige and brown fabrics. In the market, it is almost impossible to buy fabric samples identical in color. Color of white was varied in swatches. Even if fabric samples were custom dyed, the fabrics would not look exactly alike because of different surface qualities and fiber content. Therefore, some minor variations in color cannot be avoided. The variations of white among samples could have affected responses to fabric hand.

Relating color (value) effects to affective responses, Minshall, Winakor, and Swinney (1982) proposed that garments pictured in light values are preferred over those shown in dark values. In contrast, Winakor and Navarro (1987) determined that liking and disliking of styles were affected by value and value placement. They stated that consumer preferences for fashions shown in black and white illustrations may be unpredictably influenced by fabric value and value combinations used. In the present research, focus group respondents were unfamiliar with white denim fabric and did not identify it with popular blue denim. Therefore, the color in which a specific fabric is presented may affect preferences. Presenting all fabrics in the same color may not result in unbiased responses.

One objective of this research was to develop hypotheses concerning factors that influence fabric hand in the United States and Korea. Cultural differences in responses to textile stimuli were partly caused by association with different types of event. In focus groups,

U. S. males and females said that organdy and satin could be used for prom dresses and wedding dresses. As Winakor and Navarro (1987) mentioned, white is associated with weddings and christenings, black with funerals in Western clothing.

However, white is associated with traditional Korean funerals, and vivid colors such as red, yellow, and green with traditional weddings in Korea. Now Korean culture has partially adopted Western practices. Therefore, Koreans wear white wedding dresses and black funeral dresses as well as traditional costume on those occasions. Korean females in the focus group interview mentioned that they could wear organdy for traditional Korean dress if it is dyed with bright colors. A Korean male felt "sad" when he saw organdy because of its white color. Although the other males mentioned organdy for wedding veils, he still perceived white as traditional funeral color. Results from the focus group interviews suggested cultural differences in responses were caused partly by color. Students in focus groups could comment about their color perception because they could see fabrics. Therefore, for future research for comparing fabric hand among different cultural groups, judges should see and touch stimuli rather than touch them without seeing.

This research was limited to seven sets of woven fabrics for shirts. Therefore, the properties for evaluation of fabric hand were also limited. Each fabric was cut into swatches 20x20 cm in size. This practice may affect perceived preferences for shirting fabrics because the respondents may have difficulty in imagining a shirt from a white swatch. Moreover, each respondent may think of a different style or design which he or she likes or dislikes. In addition, judges may have difficulty in evaluating flowing or other properties using 20x20 cm swatches taped on hardboard. Therefore, different results may appear if different stimuli and different techniques are used.

Other limitations

Another limitation of the research was lack of control of environmental conditions such as temperature, humidity, and lighting. The present research was done in classrooms and lounges. Lighting conditions of these places were varied. The environmental conditions where the final instrument was administered were $21 \pm 4^{\circ}C$ and $70 \pm 5\%$ R. H. in Korea and $24 \pm 2^{\circ}C$ and $47 \pm 12\%$ R. H. in the United States. The groups of judges varied in size. These different environmental conditions, especially relative humidity, might affect responses to cool. Variations of environmental conditions could affect the responses to fabric hand. However, when dealing with consumer judges, overly artificial environmental conditions may affect responses to textile stimuli.

Implications for manufacturers and retailers

Results of this research suggested various practical problems for exporting and importing countries of textiles and apparel. For example, if the manufacturers of textiles and garments in Korea use Korean subjects and the Korean language to judge fabric hand and preferences, the results may not be applicable to consumers of other countries because of cultural differences as well as meaning differences between languages. Therefore, knowledge of cultural and meaning differences for fabric hand as well as the other properties of textiles and clothing are very important to international manufacturers and retailers.

CHAPTER VI. SUMMARY

The purposes of this research were to develop comparable sets of unipolar adjectives for consumer evaluation of fabric hand for English and Korean speakers and to examine how males and females in the United States and Korea use these descriptors. This research also examined preferences for hand for the specific end use of shirt for the judge's own sex and for the other sex.

Fabric hand is used to describe fabric quality and suitability for a specific end use. Therefore, hand is important to fabric and its product marketability in consumer end uses. Fabric hand may be evaluated by mechanical apparatus and by human judges using the psychophysical or the psychological technique. The psychological approach is an appropriate technique for affective or subjective measurement of fabric hand, including preferences, because human judgments of fabric hand provide multi-dimensional understanding of fabric properties. In measurement of affective aspects of fabric hand, the psychological approach uses consumer judges because sensory evaluation of fabric hand by consumers gives information about perception and preferences for fabric for a specific end use for consumers.

In using the psychological approach, some researchers found that males and females differ in their evaluation of affective stimuli. For example, Winakor, Canton, and Wolins (1980) found responses of males to affective scales to be more homogeneous and less extreme than those of females. However, no research was found that was designed to determine sex differences in assessment of fabric hand.

Many researchers investigated perceived fashion preferences of females using the psychological approach. Lubner-Rupert and Winakor (1985) measured male and female fashion preferences for both same-sex and other-sex garments. They found that males and

females responded differently in evaluating stimuli for themselves and for the other sex. The results may differ if different stimuli, perhaps fabric hand, are used.

International trade has been increasing in apparel and other textile products in recent years. Korea was the third largest exporting country in apparel to the United States in 1983. Cultural differences and communication between importing and exporting countries can present problems. Cultural differences among countries may affect consumers when they are selecting apparel and textiles. Although several researchers mentioned that there might be cultural differences in responses to fabric hand, there was no clear evidence. In some cases, researchers used expert judges to examine cultural differences. In addition, language differences may affect responses to fabric hand; a researcher found that there were meaning differences even though two words are regarded as equivalent in the two languages.

The semantic differential has been used to evaluate quality of fabric hand. However, problems may occur when bipolar adjectives are not exact antonyms. Also, word pairs that are antonyms in English may not be antonyms in another language. Therefore, unipolar adjectives rather than bipolar adjectives were used in this research to reduce the problem of matching antonyms in both languages.

Procedure

Stimuli were selected to represent shirting fabrics for U. S. and Korean consumers as well as for females, males, and for both. Judges could see and touch fabrics simultaneously. Seeing and touching is what consumers actually do when they buy textile products. All fabric swatches were white to avoid color effects. All instruments for these procedures were in English for native English speakers and in Korean for native Korean speakers. Instruments were administered separately to U. S. and Korean groups. The procedure for this research

included the following four phases: focus group interviews, word list development, trial, and final data collection.

Focus group interviews were designed to collect hand descriptors of fabrics and to examine sex differences and cultural differences among natives of Korea and the United States. Fabrics chosen for focus group interviews were selected for variety and familiarity to consumers so that respondents would be able to give diverse and clear descriptions. Five white fabrics were cut into 44x44 cm swatches. The research instrument was developed by translating fabric hand descriptors from focus group interviews and literature reviews to English from Korean or vice versa. Experts who are fluent in both Korean and English reviewed the translations. Twenty-five items including 23 adjectives and two preferences items were selected for the trial instrument. An 11-point certainty scale was used for responses to the unipolar adjectives and the two sentence questions. Six white shirting fabrics were selected for trial. Each fabric was cut into 20x20 cm swatches. Twenty each of native Korean speaking males and females and 20 each of native English speaking males and females participated in trial administrations. Responses to the 25 items were transformed to approximately normalized ranks which could range from -8 to +8.

After analysis of item responses, a total of 20 items including 18 adjectives and two preference items survived for final data collection. The final instrument included three sections: a cover letter, seven fabric hand evaluation response sheets, and a demographic background sheet. Seven white shirting fabrics were selected from retail stores in the United States and Korea. Each fabric was cut into 20x20 cm swatches. Final data were collected in Korea and the United States. Korean data were collected in the summer of 1991 from 140 Korean students at Seoul National University in Seoul, half males and half females. The U. S. data were collected in the fall of 1991 from 155 students at Iowa State University in Ames, 87 males and 68 females. Among the 87 male students, 17 male students were ineligible.

Therefore, 70 male students were included for analysis. The 11-point certainty scales and transformation of responses to normalized ranks were used as in the trial.

The means and standard deviations of responses of U. S. and Korean males and females were plotted to examine the response patterns of males and females as well as English speakers and Korean speakers. Analyses of variance were performed for each of 20 items and for the seven fabrics using the total data set and subsamples by country and sex. The analysis of data separately by sex and by country revealed a few differences in details, as compared with the analysis of all data together. However, no major new conclusions resulted from the analysis of data by subsamples. Therefore, for these data, the differences in variances seemed to have limited impact on the outcome of the analysis of variance.

Findings and Recommendations

To examine the hypotheses of this research, statistical results as well as other information such as comments made during the focus group interviews were used.

The first hypothesis stated that U. S. and Korean consumers do not differ in their responses to fabric hand. A critical point in investigating cultural differences in evaluation of fabric hand between the U. S. consumers and Korean consumers was differentiating language differences from cultural differences. Generally the main effect for country seemed to indicate meaning differences between English and Korean. Some words such as harsh and smooth appear to have different meanings between English and Korean. Cultural differences were implied in the main effect for country as well as in the interaction of country by fabric and sex by country by fabric. The responses to cool and sheer suggested cultural and environmental differences between two countries. The three-way interaction of sex by country by fabric clearly showed cultural differences for the two words. Korean males were more certain about

sheerness of fabrics than Korean females were, while results were usually opposite for U. S. males and females. Korean judges were more certain than English speaking judges were that the two crash fabrics were cool. Therefore, the first hypothesis was rejected.

The second hypothesis stated that male and female consumers do not differ in their responses to fabric hand. The main effect for sex and the interactions of sex by fabric, sex by country , and sex by country by fabric were used to examine this hypothesis. The mean responses for females were significantly larger (absolute value) than the responses for males. The response patterns of males and females suggested that the females were more certain about their responses than the males were. Also, the females had larger standard deviations; thus the females' responses were more heterogeneous than those of the males. However, the interaction of country by sex suggested that the pattern that females responded more intensely to affective stimuli was more pronounced and more consistent for the U. S. subjects than for the Korean subjects. The second hypothesis was rejected.

The third hypothesis stated that for a specific end use, consumers prefer the same fabrics for their own sex and for the other sex. The hypothesis was tested by examining items 19 and 20, which asked preferences for each fabric for the respondent and for someone of the other sex. The main effect for sex indicated that males and females differed in their preferences for the seven fabrics for themselves and for the other sex. The means for the main effect for sex showed that the females across countries preferred the average of the seven fabrics for shirts for themselves, while they were uncertain for males. The males across countries did not prefer the average of the seven fabrics for themselves, but they preferred the fabrics for females. Although the main effect for country was not significant, the interaction of country by fabric implied that preferences for specific fabrics differed between U. S. and Korean respondents. Korean subjects tended to prefer crash type fabrics, while U. S. subjects preferred twill and oxford. In addition, U. S. female subjects preferred a flat crepe for

themselves, but Korean females did not prefer it for themselves. The three-way interaction of country by sex by fabric also supported sex and cultural differences for preferences for the judges themselves and for the other sex. Thus the third hypothesis was rejected.

This research has implications for future research. A list of Korean hand descriptors elicited from the Korean focus group interviews may be useful in future research. However, researchers need to collect various Korean hand descriptors using varied stimuli and spoken and written techniques. In addition, central meanings of fundamental English and Korean words for hand need to be compared because many words seemed to be used differently in the two languages in this research.

Results of this research also brought out some issues. The finding that females respond more intensely to textile hand suggested need for caution when researchers interpret results for male responses versus female responses because this pattern differed by culture.

Although all white fabrics were chosen to avoid color effects, cultural differences in responses to textile hand resulted from associations with the white color. In the present research, U. S. and Korean subjects had different perceptions of white fabrics.

Each fabric was cut into swatches 20x20 cm in size. This practice may affect perceived preferences for shirting fabrics because each subject may think of a different style or design which he or she likes or dislikes. In addition, judges may have difficulty in evaluating flowing or other properties using 20x20 cm swatches. Therefore, different results may appear if different stimuli and different research techniques are used.

Results of this research suggested practical problems in international trade of apparel and textiles because of cultural differences among countries as well as meaning differences among languages. Therefore, information about cultural and meaning differences for fabric hand as well as the other aspects of textiles and clothing are very important to international manufacturers and retailers.

REFERENCES

Alexander, H. H., Alexander, M. A., & Tzeng, O. C. S. (1978). Designing semantic differential scales for a universe of the near environment--chairs. Home Economics Research Journal, 6, 293-304.

Anttila, P. (1988, July 24-29). The tactile evaluation of textiles on the basis of cognitive psychology, compared to physical analyses. International Federation for Home Economics XVI World Congress, Presentation No. 187, Minneapolis, MN.

ASTM. (1989). Annual book of ASTM standards (section 7). Philadelphia: American Society for Testing and Materials.

Behery, H. M. (1986). Comparison of fabric hand assessment in the United States and Japan. Textile Research Journal, 56, 227-240.

Bogaty, H., Hollies, N. R. S., & Harris, M. (1956). The judgment of harshness of fabrics. Textile Research Journal, 26, 355-360.

Brand, R. H. (1964). Measurement of fabric aesthetics. Textile Research Journal, 34, 791-804.

Brown, P. (1969). The characterization of bulk. Textile Research Journal, 39, 395-412.

Chang, L. (1986). Comparison of fabric hand descriptions elicited by touch versus touch and sight. Unpublished master's thesis, Iowa State University, Ames.

Cline, W. R. (1990). The future of world trade in textiles and apparel. Washington, D. C.: Institute for International Economics.

Dong-A's new concise Korean-English dictionary (3rd ed.). (1984). Seoul, Korea: Dong-A Press.

Elder, H. M. (1977). Fabric appearance and handle. Journal of Consumer Studies and Home Economics, 1, 171-182.

Fritz, A. (1987, March). Aesthetics of fabric handle. Modus, pp. 55-58.

Fritz, A., Harwood, R. J., & Smith, L. (ca. 1987). Evaluation of handle of fabrics: Cultural differences in fabric preference. Unpublished manuscript, Sydney Institute of Education, Sydney College of Advanced Education, New South Wales, Australia.

Gatty, B. (1983). Textile trade: The battle to bring imports into balance. DuPont Context, 12, 12-15.

Goings, B. D. (1971). Changes in fashion preference for skirt length and silhouette. Unpublished master's thesis, Iowa State University, Ames.

A Handbook of Korea. (3rd ed.). (1979). Seoul: Korea Overseas Information Service.

Hoffman, R. M., & Beste, L. F. (1951). Some relations of fiber properties to fabric hand. Textile Research Journal, 21, 66-77.

Hollies, N. R., Custer, A. G., Morin, C. J., & Howard, M. E. (1979). A human perception analysis approach to clothing comfort. Textile Research Journal, 49, 557-564.

Horne, L. (1991). Risks perceived by husbands and wives in giving clothing gifts within the family. Doctoral dissertation, Iowa State University, Ames.

Howorth, W. S., & Oliver, P. H. (1958). The application of multiple factor analysis to the assessment of fabric hand. Journal of the Textile Institute, 49, T540-T553.

Hyun, S. O., Hollies, N. R., & Spivak, S. M. (1991). Skin sensations perceived in apparel wear. Part I: Development of a new perception language. Journal of the Textile Institute, 82, 389-397.

Kaiser, S. (1990). The social psychology of clothing (2nd ed.). New York: Macmillan.

Kawabata, S. (1984). The development of the objective measurement of fabric handle. Journal of Industrial Fabrics, 2(4), 4-31.

Kawabata, S., & Niwa, M. (1975). Analysis of hand evaluation of wool fabrics for men's suit using data of thousand samples and computation of hand from the physical properties. Proceedings of the 5th International Wool Textile Research Conference, 5, 413-424.

Kim, C. J., & Piromthamsiri, K. (1984). Sensory and physical hand properties of inherently flame-retardant sleepwear fabrics. Textile Research Journal, 54, 61-68.

Kim, C. J., & Vaughn, E. A. (1979). Prediction of fabric hand from mechanical properties of woven fabrics. Journal of the Textile Machinery Society of Japan, 32(6), 43-52.

Kim, S. Y., & Yoon, W. S. (1983). Standard evaluation of fabric handle. Report of the Research Institute of Industrial Science, 6(1), 15-25.

Kipp, S. H. (1980). Field estimation of ensemble clo value: Comparison of two approaches. Unpublished master's thesis, Iowa State University, Ames.

Krueger, R. A. (1988). Focus groups: A practical guide for applied research. Newbury Park, CA: Sage.

Lee, J. K., & Kim, S. J. (1983). The handle of fabrics and the procedure condition. Journal of Textile Industrial Society of Korea, 20(6), 58-67.

Lubner-Rupert, J. A., & Winakor, G. (1985). Male and female style preference and perceived fashion risk. Home Economics Research Journal, 13, 256-266.

Lundgren, H. P. (1969). New concepts in evaluating fabric hand. Textile Chemist and Colorist, 1 (1), 1-11.

Mahar, T. J., & Postle, R. (1984). Fabric handle equations for Australia, New Zealand, India, and U. S. A. Journal of the Textile Machinery Society of Japan, 37(9), 43-47.

Manikowske, L., & Winakor, G. (1991). Equity, attribution, and reactance in giving and receiving gifts of clothing. Unpublished manuscript, Iowa State University, Textiles and Clothing Department, Ames.

Merkel, R. S. (1991). Textile product serviceability. New York: Macmillan.

Minshall, B., Winakor, G., & Swinney, J. L. (1982). Fashion preferences of males and females, risk perceived, and temporal quality of styles. Home Economics Research Journal, 10, 369-379.

New world concise English-Korean dictionary. (1979). Seoul, Korea: Shisa English Press.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). The measurement of meaning. Urbana: University of Illinois Press.

Paek, S. L. (1978). Response profile of flame-retardant fabric hand. Textile Research Journal, 48, 487-489.

Paek, S. L. (1982). Consumer preference for skin contact wear fabrics. Textile Research Journal, 52, 264-265.

Paek, S. L. (1985). Effect of scaling method on perception of textiles. Perceptual and Motor Skills, 60, 335-338.

Pearson, E. S., & Hartley, H. O. (1954). Biometrika tables for statisticians, 1. Cambridge: Cambridge University Press.

Rabolt, N. J., Bothwell, K., Forney, J. C., & Barry, M. (1988). Quality control in overseas apparel manufacturing. Journal of Consumer Studies and Home Economics, 12, 386-397.

Roberts, M. D. (1963). Comparison of fabric descriptors by consumers and home economists. Unpublished master's thesis, Iowa State University, Ames.

SAS/STAT User's guide. (1989). Cary, NC: SAS Institute Inc.

Schwarz, A. N. (1939). Technical evaluation of finishing treatments. American Dyestuff Reporter, 28, 138-146.

Stearn, A. E., D'Arcy, R. L., Postle, R., & Mahar, T. J. (1985). A statistical analysis of subjective and objective methods of evaluating fabric hand. Journal of the Textile Machinery Society of Japan, 38(8), 62-68.

Steel, R. G., & Torrie, J. H. (1980). Principles and procedures of statistics (2nd ed.). New York: McGraw-Hill.

Sternquist, B., & Davis, B. (1986). Store status and country of origin as information cues: Consumer's perception of sweater price and quality. Home Economics Research Journal, 15, 124-131.

Stevens, S. S. (1958). Problems and methods of psychophysics. Psychological Bulletin, 55, 177-196.

Sweeney, M. M., & Branson, D. H. (1990). Sensory comfort. Part I: Psychophysical method for assessing moisture sensation in clothing. Textile Research Journal, 60, 371-377.

U. S. International Trade Commission. (1984). U. S. imports of textile and apparel products under the multifiber arrangement, 1976-1983. Washington, D. C.: U. S. Government Printing Office.

U. S. Senate, Committee on Finance, Subcommittee on International Trade. (1989). Agreements being negotiated on the multilateral trade agreements in Geneva. (U. S. International Trade Commission Investigation No. 332-101. MTN Studies, No. 6, Part 5).Washington, D. C.: U. S. Government Printing Office.

Vaughn, E. A., & Kim, C. J. (1973). Fundamentals of fabric hand: The problem of the objective measurement of a subjective phenomenon. International Nonwovens and Disposables Association, Symposium papers, Washington, D. C.

Warren, R. D., Klonglan, G. E., & Sabri, M. M. (1969). The certainty method: Its application and usefulness in developing empirical measures in social sciences (Rural Sociological Report No. 82). Ames: Department of Sociology and Anthropology, Iowa State University.

Wauer, M. R. (1965). Consumers' and home economists' fabric descriptions. Journal of Home Economics, 57, 33-35.

Weon, M. S., & Kahng, H. W. (1983). The relationship between unsex clothing behavior and sex role of Korean college students. Journal of the Korean Society of Clothing and Textiles, 7 (2), 37-44.

Whisney, A. J., Winakor, G., & Wolins, L. (1979). Fashion preference: Drawings versus photographs. Home Economics Research Journal, 8, 138-150.

Winakor, G. (1982). A questionnaire to measure environmental and sensory factors associated with personal comfort and acceptability of indoor environments. ASHRAE Transactions, 88(2), 470-491.

Winakor, G., Canton, B., & Wolins, L. (1980). Perceived fashion risk and self-esteem of males and females. Home Economics Research Journal, 9, 45-56.

Winakor, G., & Goings, B. D. (1973). Fashion preference: Measurement of change. Home Economics Research Journal, 1, 195-209.

Winakor, G., Kim, C. J., & Wolins, L. (1980). Fabric hand: Tactile sensory assessment. Textile Research Journal, 50, 601-610.

Winakor, G., & Navarro, R. (1987). Effect of achromatic value of stimulus on responses to women's clothing styles. Clothing and Textiles Research Journal, 5(2), 40-48.

Yuan, R. (1990). Semantic transferability and prototypicality in Chinese and English- A study of the semantic acquisition of "thin" by Chinese learners of English. Unpublished master's thesis, Iowa State University, Ames.

ACKNOWLEDGMENTS

I would like to thank all of the people who have made contributions to the completion of this dissertation. First of all, I express my appreciation to my advisor, Geitel Winakor, for her guidance and encouragement through this research. I thank her willingness to spend the time working with me. Her suggestions and ideas were invaluable resources.

To the members of the committee, Mary Lynn Damhorst, Sara Kadolph, Kenneth Koehler, and Gregory Maxwell, I thank you all for your advice and assistance. I would also like to thank the consultants, Charles Kim, Eun-Young Rhee, Sung Reon Kim, Soyeon Shim, Yoon-Hee Kwon, and Soae Paek, for their important contributions to this research.

Special thanks goes to instructors and students for taking time to participate in my research. Without their cooperation, this study would not have been possible.

Finally, all the thanks to my family, especially mother and father, for the endless support, encouragement, and loving through the entire period of my study. Without their support, I could not have finished this research. Another thanks to my husband for his help, patience, and encouragement he gave me and for always being there when I needed him.

APPENDIX A:

INSTRUMENT FOR FOCUS GROUP INTERVIEW

INVITATION

Thank you for accepting our invitation to attend the discussion on fabric hand. The discussion will be held at _____ on _____.

Since we are talking to a limited number of people, the success and quality of our discussion is based on the cooperation of the people who attend. Because you have accepted our invitation, your attendance at the session is expected and will help to make the research project a success.

The discussion you will be attending will be about the handle of fabric when people touch and see the fabrics. We would like to get your opinions, as a consumer, on this subject.

This is a research project. You will not be required to discuss topics about which you feel uncomfortable. Your comments will be kept confidential and your name will not be connected with your responses in any way.

If for some reason you find you are able to attend, please call us to let us know as soon as possible. Our phone numbers are (515) 294-3264 (Hyunsik Kim) and (515)294-1930 (Dr. Geitel Winakor).

We are looking forward to seeing you on _____.

Sincerely,

Group Moderator

OPENING STATEMENT

Time

3:00 Good afternoon and welcome to our session. Thank you for taking the time to join our discussion of fabric hand. My name is Hyunsik Kim and I am a Ph. D student in Textiles and clothing Department. Assisting me is _____ also from _____. We are attempting to get information about hand of fabric when people touch and see fabrics. We have invited person from different backgrounds to share their perceptions and ideas. We are interested in your opinion because you are representative of U. S. consumers.

Today we will be discussing the handle of fabric when people touch and see the fabrics. The handle of fabric is one of the most important factors that influences acceptance of a fabric by consumers. Also human judgment using words for fabric hand provides more complete understanding of fabric properties than purely laboratory tests. There are no right or wrong answers but rather differing descriptions of fabric hand.

we have two stages for this session. First, we would like to use your own words to describe hands of fabrics when you see and touch the fabrics. Here on the table are fabrics and response sheets. Please fill out a different sheet for each fabric. Do not put your name on the sheets. You can touch, rub, squeeze, and see the fabrics. And then write as many words as you can think of to describe the hand of each fabric. We will
3:10 take about 20 minutes for this task. Let's start.

3:30 For the discussion about fabric hand, please feel free to share your opinion even if it differs from what others have said. Feel free to refrain from discussing any topics about which you feel uncomfortable.

Before we begin let me remind you of some of the ground rules. This is a research project. Please speak up but only one person should talk at a time. We're tape recording the session because we don't want to miss any of your comments.

We'll be on a first name basis today and in our reports there will not be ant names attached to the comments. You can be assured of complete confidentiality.

The session will last about one hour. Feel free to help yourself to more refreshments at any time.

Let's begin. There are name cards on the table in front of you to help us remember each other's names. Q-1) When you select clothing and textiles in the store, what kind of fabric hand do you prefer? (concern of specific end use such as shirts)

TOPICS FOR ORAL DISCUSSION

Q-2 How would you describe these fabrics?
Q-3 Tell me about texture for these fabrics.
Q-4 How would you describe bending characteristics for these fabrics?
Q-5 What about comfort characteristics for these fabrics?
Q-6 How would you describe the compressibility for these fabrics?
Q-7 What about strength for these fabrics?
Q-8 How would you describe the visual characteristics of these fabrics?

Probes if ideas have not come up spontaneously:

* How could you describe frictional or surface texture characteristics for these fabrics?
* How would you describe luster (pattern and transparency) characteristics for these fabrics?

CLOSING REMARKS

Time

4:30 The purpose for our meeting today was to discuss descriptions for fabric hand and preference of fabric hand as a consumer. Do you have any additional comments or feel we have missed anything in our discussion?

We are conducting three more group discussions including Korean female and male and an American male (female) group. Findings from these discussion will be used to develop an instrument for fabric hand research. Remember you can be assured of complete confidentiality and we would like you to keep our discussion confidential as well.

Thank you again for taking the time to join us this afternoon. Your opinions have been most helpful.

Fabric _____

Write as many words as you can that describe the feel or handle of this fabric.

Background Questionnaire

Your answers to the following questions about yourself will help interpret the results of the study. Please circle the number that describe yourself.

1. What is your sex?

    1. Female
    2. Male

2. What is your age?

    1. 17 or under
    2. 18-21
    3. 22 or older

3. Are you currently married?

    1. No
    2. Yes

4. Which is your year in school?

    1. Freshman
    2. Sophomore
    3. Junior
    4. Senior
    5. Special student
    6. Graduate student

5. What is your college?

    1. Agriculture
    2. Business Administration
    3. Design
    4. Education
    5. Engineering
    6. Family and Consumer Sciences
    7. Sciences and Humanities
    8. Veterinary Medicine
    9. Graduate

6. What is your major?

    _____

초청장

직물촉감에 관한 토론에 참가하여 주심을 감사드립니다. 토론은 _____월 _____일 _____시 _____에서 열릴 예정입니다.

이번 토론은 특히 제한된 인원으로 진행되기 때문에 무엇보다도 여러분의 참석을 필요로 합니다.

귀하가 참석하시게 될 토론의 주제는 직물을 만지거나 볼때 느낄수 있는 직물촉감에 관한 것으로 저희는 이 주제에 대하여 소비자로서 귀하의 의견을 얻고자 합니다.

직물촉감에 관한 이번 토론은 연구과제이기 때문에 만일 귀하가 주제에 관해서 어려움을 느끼신다면 대답하지 않아도 됩니다. 또한 귀하의 의견은 비밀로 지켜질 것이며, 귀하의 성명과 이번 의견은 어떤 방법으로도 연관되지 않음을 알려드립니다.

만일 참석이 어려우시면 가능한 빨리 저희에게 연락해 주십시요. 연락처는 (515) 294-3264 (김현식), 그리고 (515) 294-1930 (Dr. Winakor) 입니다.

귀하를 _____에 만나 뵙기를 바랍니다.

김 현 식

시작말

시 간

3:00 안녕하세요. 오늘 저희의 직물촉감에 관한 토론에 참여하여 주셔서 감사합니다. 저의 이름은 김현식으로 T&C에서 박사과정중에 있읍니다. 오늘 토론에서 저를 도와 주실 분은 _____입니다. 오늘 토론의 주제는 여러분께서 알고 계신 바와 같이 직물촉감에 관한 것으로, 저희는 사람들이 직물을 만지거나 볼때 느껴지는 촉감에 여러분의 의견을 얻고자 합니다. 이번 토론에서는 특히 여러사람들의 직물에 관한 느낌과 생각을 소비자의 입장에서 알아보기 위해서 각기 다른 배경을 가진 여러분을 토론의 참여자로 초대했읍니다. 저희는 한국 소비자로서의 여러분의 의견에 관심이 있읍니다.

오늘의 주제는 여러분께서 알고 계신 바와 같이 직물의 촉감입니다. 직물의 촉감은 소비자가 직물을 선택할때 영향을 미치는 가장 중요한 요소의 하나로서 언어로 표현된 직물촉감에 대한 소비자의 판단은 실험실에서 행해지는 어떤 조사보다도 직물의 특성을 이해하는데 가장 좋은 방법입니다. 이와같은 소비자의 판단을 알아보는 조사에서는 옳거나 틀린 대답은 없고 단지 직물촉감에 관한 소비자들의 다양한 느낌, 즉 묘사만이 중요합니다.

무엇보다도 오늘 토론에서 여러분께서 꼭 지켜주셔야 하는것은 직물촉감을 묘사하는데 있어서 여러분 자신의 단어를 사용해 주셨으면 합니다. 여러분께서 보시는 바와 같이 이 탁자위에 각각의 다양한 직물들과 대답용지가 있읍니다. 각각의 직물에 각기 다른 대답용지를 사용해 주십시요. 여러분의 느낌을 적으실때 자신의 이름은 적지 마십시요. 여러분들은 직물을 만지거나, 비비거나, 그리고 구겨볼 수 있읍니다. 이와같이 직물에 관한 촉감을 알아보신 다음에 각각의 직물촉감에 대해 묘사할수있는 모든 단어들을 적어 주십시요.

3:10 20분 동안 제가 지금까지 설명한 작업을 하십시요. 자! 시작하세요.

3:30 직물촉감에 대한 토론에서 만일 다른 사람들이 말하는 것이 여러분의 견해와 다르다고 해도 걱정하지 않으셔도 되며 또한 여러분이 불편하다고 느끼시는 부분에 대한것은 말씀 않하셔도 됩니다.

토론을 시작하기 전에 한가지 유의사항을 말씀드리겠읍니다. 이것은 하나의 연구과제입니다. 그러니까 제발 허심탄회하게 여러분의 의견을 말씀해주시고, 특히 한번에 한사람씩 말씀해 주십시요. 저희는 여러분의 의견을 하나라도 놓치고 싶지 않기 때문에 이 토론을 녹음할 것입니다.

우선 토론은 이름을 말하는 것부터 시작되지만, 저희가 이번 토론의 결과를 보고서로 작성할 때는 여러분의 이름은 보고되지 않고 완전히 비밀로 지켜질 것입니다.

이 토론은 약 1시간 정도 지속될 예정으로 음료수가 필요하신 분들은 언제든지 갖다드십시요.

그럼 시작하죠. 탁자위에 여러분의 이름표가 있읍니다. 질문-1) 여러은 상점에서 옷이나 직물을 살때 어떠한 직물의 촉감을 좋아하십니까? (여를 들면 셔츠를 살때).

토론을 위한 주제들

질문-2 여러분은 이 직물들에 대하여 어떻게 묘사하시겠읍니까?
질문-3 이 직물들의 질감에 대해 말씀해주십시요.
질문-4 이 직물들의 구부러지는 성질들을 여러분은 어떻게 묘사하시겠읍니까?
질문-5 이 직물들의 쾌적감은 어떻읍니까?
질문-6 이 직물들의 압축성에 대해 여러분은 어떻게 묘사하시겠읍니까?
질문-7 이 직물들의 강도는 어떠합니까?
질문-8 이 직물들의 시각적 특징을 어떻게 묘사하시겠읍니까?

만일 즉각적인 반응이 나타나지 않으면 탐구할 질문들:

* 여러분은 이 직물들의 마찰이나 표면질감에 대해 어떻게 묘사하시겠읍니까?
* 여러분은 이 직물들의 광택 (패턴, 비치는 정도) 에 대한 성질에 대해 어떻게 묘사하시겠읍니까?

맺음말

시간
4:30 저희 모임의 목적은 직물촉감에 관한 묘사와 소비자로서 직물촉감의 선호에 관한 토의였읍니다. 이 토의에서 덧붙일 말이나 빠뜨린것이 있다고 느끼시면 말씀해 주십시요.

저희는 남 (여) 모임과 미국인 남녀 모임을 포함하는 3개의 토론모임이 더 있읍니다. 이 토의로 부터의 결과는 직물촉감 연구의 기구를 개발하기 위해 쓰일 여정입니다. 여러분의 의견은 완전히 비밀로 지켜질 것이며, 여러분 역시 이 토론의 내용을 비밀로 지켜 주시길 바랍니다.

오늘 오후 저희 모임에 시간을 내주셔서 감사드립니다. 여러분의 의견은 매우 유익했읍니다.

배경 질문지

다음 질문에 관한 귀하의 대답은 이 연구 결과를 해석하는데 도움이 될것입니다.

1. 귀하의 성별은?

   1) 여자
   2) 남자

2. 귀하의 나이는?

   1) 17 또는 그 이하
   2) 18-21
   3) 22 또는 그 이상

3. 귀하는 현재 결혼을 하셨읍니까?

   1) 아니오
   2) 예

4. 귀하의 학년은?

   1) 1학년
   2) 2학년
   3) 3학년
   4) 4학년
   5) 특별학생
   6) 대학원생

5. 귀하의 대학은?

   1) 농과대학
   2) 경영대학
   3) 디자인대학
   4) 교육대학
   5) 공과대학
   6) 가정대학
   7) 인문과학대학 & 자연과학대학
   8) 수의과
   9) 대학원

6. 귀하의 전공은?

_____

직물 _____

이 직물에 대한 느낌이나 촉감에 대해서 되도록이면 다양한 단어를 사용하여 묘사하여 주십시요.

APPENDIX B:

LIST OF 131 UNIPOLAR ADJECTIVES

IN ENGLISH AND KOREAN

ENGLISH	KOREAN
Bending Category	구부러지는 성질에 관한 항목
crisp	아삭아삭한
firm	단단한
flimsy	상하기 쉬운
flexible	유연한
limp	축늘어지는
papery	종이같은
pliable	구부리기 쉬운
stiff	뻣뻣한
Comfort Category	쾌적감에 관한 항목
clingy	몸에 달라 붙는
comfortable	쾌적한
cozy	안락한
sticky	끈적끈적한
Thermal Comfort Category	온열 쾌적감에 관한 항목
absorbent	흡수성이 있는
airy	통기성이 있는
breezy	바람이 잘 통하는
cold	차가운
cool	시원한
hot	더운
warm	따뜻한

Compressibility Category 압축성에 관한 항목

bulky	부피가 있는
compact	빽빽한
compressible	압축할수 있는
cushiony	푹신한
fluffy	가볍고 푹신한
fuzzy	잔털이 있는
hard	딱딱한
loose	느슨한
soft	부드러운

Drapeability Category 주름이 잡히는 성질에 관한 항목

drapey	우아한 주름이 잘 잡히는
flow well	잘 처지는
slinky	하늘하늘한
supple	나긋나긋한
starchy	풀 먹인것 같은

Fabric Name Category 천이름에 관한 항목

cottony	면같은
satiny	공단같은
silky	명주같은
velvety	벨벳같은
wooly	양모같은

Resilience Category 탄력성에 관한 항목

lively ..... 탄력있는
resilient ..... 탄력있는
rubbery ..... 고무같은
stretchy ..... 늘어나는
springy ..... 탄력있는
wrinkling ..... 구김이 가는

Strength Category 강도에 관한 항목

durable ..... 내구성이 있는
flimsy ..... 연약한
fragile ..... 부서지기 쉬운
resistant ..... 저항력이 있는
strong ..... 강한
sturdy ..... 든든한
tough ..... 질긴
weak ..... 약한
tearable ..... 찢어지기 쉬운

Stretch Category 신도에 관한 항목

elastic ..... 신축성이 있는
stretchy ..... 잘 늘어나는

Structure Category 조직에 관한 항목

compact..... 빽빽한
felt-like..... 펠트같은
loose..... 느슨한
tight..... 촘촘한

Texture Category 결에 관한 항목

textured..... 질감이 있는

Frictional Texture Category 마찰결에 관한 항목

coarse..... 거칠고 굵은실로 짜여진
fine..... 고은실로 짜여진
flat..... 평평한
furry..... 모피같은
gentle..... 부드러운
harsh..... 꺼끌한
itchy..... 가려운
rough..... 거칠은
noisy..... 비빌때 소리가 나는
rustly..... 바삭거리는
scratchy..... 따끔따끔한
silky..... 매끈매끈한
slippery..... 미끌미끌한
smooth..... 매끈한

Surface Texture Category 표면결에 관한 항목

bumpy..... 울퉁불퉁한
even..... 고른
hairy..... 털이있는
irregular..... 불규칙한
lumpy..... 잔덩어리가 있는
nappy..... 보풀보풀한
regular..... 고른
ribbed..... 이랑이 있는
ripply..... 물결무늬가 있는
sandy..... 모래같은

Value Judgment Category 가치판단에 관한 항목

appealing..... 호감이 있는
cheap..... 값싸보이는
delicate..... 섬세한
elegant..... 우아한
expensive..... 값비싸보이는
feminine..... 여성스러운
fine..... 우수한
lofty..... 고상한
masculine..... 남성스러운
rich..... 고급스러워보이는
security..... 안전해보이는
sensuous..... 감각적인
sexy..... 야해보이는
simple..... 단순한

Service or Performance Category 성능에 관한 항목

durable ..... 내구성이 있는
easy to take care of ..... 관리하기 쉬운
lasting ..... 오래가는

Visual Category 시각에 관한 항목

sleazy ..... 얇은
stripey ..... 줄무늬가 있는
waffle-like ..... 와플 (눌러만든빵) 같은

Color Visual Category 색깔에 관한 항목

light color ..... 연한색의
pearlescent ..... 진주빛의

Luster Visual Category 광택에 관한 항목

bright ..... 밝은
dark ..... 어두운
dull ..... 우중충한
glisten ..... 반짝이는
greasy ..... 번들거리는
lustrous ..... 광택이 있는
reflecting ..... 빛을 반사하는
shiny ..... 빛나는

Pattern Visual Category 무늬에 관한 항목

patterned ..... 무늬가 있는
ribbed ..... 이랑이 있는
spotted ..... 반점이 있는

Transparent Visual Category 투명도에 관한 항목

opaque ..... 불투명한
seethrough ..... 들여다보이는
sheer ..... 비치는
transparent ..... 투명한
translucent ..... 반투명한

Thickness Category 두께에 관한 항목

thick ..... 두꺼운
thin ..... 얇은

Weight Category 무게에 관한 항목

heavy ..... 무거운
light ..... 가벼운
weighty ..... 무게가 나가는

APPENDIX C:

KOREAN ADJECTIVES AND THEIR PRONUNCIATION

English term	Korean term	Pronunciation of Korean term
Crisp	바삭바삭한	*Basakbasakhan*
	아삭아삭한	*Asakasakhan*
Heavy	무거운	*Mugoun*
Smooth	매끈한	*Makyenhan*
Drapey	우아한 주름이 잡히는	*Wooahan jurmi japinun*
	드레이프가 잘되는	*Dreapeyka jaldoinun*
Stiff	뻣뻣한	*Pokpokhan*
Absorbent	흡수성이 있는	*Hyupsusangi iknun*
Even	고른	*Golun*
Expensive	값비싸 보이는	*Gakbisa boinun*
Shiny	빛이 나는	*Bichi nanun*
Soft	부드러운	*Booduluon*
Flexible	유연한	*Uyonhan*
Cool	시원한	*Shiwonhan*
Loose	느슨한	*Nyusunhan*
Flowing	잘처지는	*Jalchojinun*
Strong	강한	*Kanhan*
Fuzzy	잔털이 있는	*Janteli iknun*
Harsh	꺼끌꺼끌한	*Kokyulkokyulhan*
Feminine	여성스러운	*Yesungsuluon*
Sheer	비치는	*Bichinun*
Durable	내구성이 있는	*Nagusungi iknun*
Thick	두꺼운	*Dukaun*
Elastic	신축성이 있는	*Shinchuksung iknun*
Masculine	남성스러운	*Namsungsuluon*

APPENDIX D:

INSTRUMENT FOR THE TRIAL

Iowa State University of Science and Technology Ames, Iowa 50011-1120

College of Family and Consumer Sciences
Department of Textiles and Clothing
140 LeBaron Hall
Telephone: 515-294-2628
515-294-2695

Introduction:

The producers of textile materials need more information on fabric properties that determine consumer preference for textile products. The hand of a fabric is one of the most important factors that influences acceptance of a fabric by consumers. As international trade has been increasing in apparel and other textile products, standardized terminology used to communicate subjective fabric properties is important for quality control among producers in different nations.

The Textiles and Clothing Department at Iowa State University is conducting research on descriptive words used by U. S. and Korean persons when they see and touch fabrics. While your participation in this project is voluntary, we hope that you will complete the study. It is important that you respond to each item of the questionnaire. We expect it will take about 20 minutes to complete the task. No further participation will be asked of you. There are no right or wrong answers.

Your responses will be kept confidential and will not be connected with your name in any way. If you have any questions, please feel free to ask.

We appreciate your taking the time to participate in this project.

Sincerely,

Hyunsik Kim
Graduate Research Assistant

Geitel Winakor
Professor
Textiles & Clothing Department

Sample Response Form -- Subjective Hand

This form is to be used to describe your responses to the handle of the fabric that you will be assessing. For each of the fabric samples you will have a list of adjectives as shown below in sample items. Circle the number that best describes how well you think each adjective describes the hand of the fabric:

If you are **completely certain** that the word **describes** the hand of the fabric, circle **+5.**

If you are **not completely certain,** use a number between **+4** and **+1** to indicate how certain you are that the word **describes** the hand of the fabric.

If you are **uncertain** that the word **describes** the hand of the fabric, circle **0.**

If you are **completely certain** that the word **does not describe** the hand of the fabric, circle **-5.**

If you are **not completely certain,** use a number between **-4** and **-1** to indicate how certain you are that the word **does not describe** the hand of the fabric.

Please respond to every statement. Feel free to use any number from +5 to -5.

Sample items:

	Very certain I agree (A)					Uncertain (U)				Very certain I disagree (D)	
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
	(A)					(U)					(D)
1. rough	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. fluffy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. thin	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. compact	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

Now continue to the next fabric.

Fabric _____

	Very certain I agree (A)					Uncertain (U)					Very certain I disagree (D)
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
	(A)					(U)					(D)
1. crisp	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. heavy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. smooth	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. drapey	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
5. stiff	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
6. absorbent	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
7. even	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
8. expensive	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
9. shiny	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
10. soft	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
11. flexible	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
12. cool	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
13. loose	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
14. flowing	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
15. strong	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
16. fuzzy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
17. harsh	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
18. feminine	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
19. sheer	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
20. durable	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

21. thick	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
22. elastic	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
23. masculine	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
24. I would choose this fabric for a shirt for myself.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
25. I would choose this fabric for a shirt for a male.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

Background Questionnaire

Your answers to the following questions about yourself will help us interpret the results of the study. For each question, please circle the number that best describes you.

1. What is your sex?

    1. Female
    2. Male

2. What is your age?

    1. 17 or under
    2. 18-21
    3. 22 or older

3. Are you currently married?

    1. No
    2. Yes

4. Which is your year in school?

    1. Freshman
    2. Sophomore
    3. Junior
    4. Senior
    5. Special student
    6. Graduate student

5. What is your college?

    1. Agriculture
    2. Business Administration
    3. Design
    4. Education
    5. Engineering
    6. Family and Consumer Sciences
    7. Sciences and Humanities
    8. Veterinary Medicine
    9. Graduate

6. What is your major?

    _____

Iowa State University of Science and Technology Ames, Iowa 50011-1120

College of Family and Consumer Sciences
Department of Textiles and Clothing
140 LeBaron Hall
Telephone: 515-294-2628
515-294-2695

인사의 말씀:

섬유생산품의 소비자 선호를 알기위하여 섬유업계에서는 직물특성에 관한 정보를 더욱 필요로 하고 있읍니다. 직물의 촉감은 소비자들이 직물을 선택하는데 영향을 주는 가장 중요한 요소중의 하나입니다. 의류산업에 있어서 국제 교류가 활발해짐 따라 주관적인 섬유특성을 표현하는데 사용되어지는 표준화된 용어가 국가들 간의 품질 조절을 위해서 중요해지고 있읍니다.

Iowa State University 의 의류학과에서는 한국인과 미국인 소비자가 직물을 보거나 만지는데 있어서 사용하는 표현언어에 관한 연구를 수행중입니다. 이 연구과제에서 귀하의 참여는 자발적이지만, 저희는 귀하가 이연구에 참여하시기를 바랍니다. 보다 정확한 자료를 위하여 모든 문항에 빠짐없이 응답해 주십시요. 본 설문은 약 20분이 소요되며, 옳거나 그른 대답은 없읍니다.

귀하의 응답은 비밀로 지켜질 것이며, 귀하의 이름은 어떠한 방법으로도 연결되지 않을 것입니다. 만일 질문이 있으면 자유롭게 질문해 주시길 바랍니다.

이번 연구에 귀하의 시간을 할애해 주셔서 대단히 감사합니다.

김 현식
대학원생 연구원

Geitel Winakor
교수
의류학과

응답지 견본 – 주관적 촉감

이 양식은 직물촉감에 대한 귀하의 응답을 위해서 사용될것 입니다. 각각의 직물 견본에따라 아래에 있는 문항을 사용해 주십시요. 귀하가 생각하기에 직물의 촉감을 잘 묘사했다고 생각되는 각각의 형용사의 번호에 동그라미를 해주시기 바랍니다.

만일 그 형용사가 직물의 촉감을 **확실하게 묘사했다**고 생각되시면 +5에 동그라미를 해 주십시요.

만일 **확실하지 못하다고** 생각되시면 +4 에서 -1 까지의 숫자를 사용하여 그 형용사가 얼마만큼 직물의 촉감을 **묘사하고** 있는지를 대답해 주십시요.

만일 그 형용사가 얼마 만큼 직물의 촉감을 묘사하는지 **불확실하시면 0**에 동그라미를 헤 주십시요.

만일 그 형용사가 직물의 촉감을 **묘사하지 않고** 있다고 **확신하시면** -5에 동그라미를 해주십시요.

만일 **확실하지 못하다고** 생각되시면 -4에서 -1 까지의 숫자를 사용하여 그 형용사가 얼마만큼 직물의 촉감을 **묘사하지 않고** 있는지를 대답해 주십시요.

각 문항에 빠짐없이 대답해 주시고, +5 에서 -5 까지의 어느 숫자나 자유롭게 사용하실수 있읍니다.

	매우 확실히 그러하다					잘 모르겠다				매우 확실히 그러하지 않다	
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
1. 거친	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. 포근한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. 얇은	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. 빽빽한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

섬유 _____

	매우 확실히 그러하다					잘 모르겠다					매우 확실히 그러하지 않다
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
1. 아삭아삭한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. 무거운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. 매끈한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. 우아한 주름이 잡히는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
5. 뻣뻣한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
6. 흡수성이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
7. 고른	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
8. 값비싸 보이는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
9. 빛이 나는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
10. 부드러운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
11. 유연한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
12. 시원한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
13. 느슨한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
14. 잘 처지는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
15. 강한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
16. 잔털이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
17. 꺼끌꺼끌한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
18. 여성스러운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
19. 비치는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
20. 내구성이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

21. 두꺼운 +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5

22. 신축성이 있는 +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5

23. 남성스러운 +5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5

24. 이 직물은 나의 셔츠를 위한 섬유로 선택할만 하다.

+5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5

25. 이 직물은 남성의 셔츠를 위한 섬유로 선택할만 하다.

+5 +4 +3 +2 +1 0 -1 -2 -3 -4 -5

다음 질문에 관한 귀하의 대답은 이 연구 결과를 해석하는데 도움이 될 것입니다.

1. 귀하의 성별은?

    1. 여자

    2. 남자

2. 귀하의 나이는?

    1. 17 또는 그 이하

    2. 18 - 21

    3. 22 또는 그 이상

3. 귀하는 현재 결혼을 하셨읍니까?

    1. 아니요

    2. 예

4. 귀하의 학년은?

    1. 1학년

    2. 2학년

    3. 3학년

    4. 4학년

    5. 대학원생

5. 귀하의 대학은?

    1. 농과대학

    2. 경영대학

    3. 예술대학

    4. 교육대학

    5. 공과대학

    6. 가정대학

    7. 인문과학대학 & 자연과학대학

    8. 수의과대학

6. 귀하의 전공은? _____

APPENDIX E:

INSTRUMENT FOR THE FINAL DATA COLLECTION

Iowa State University of Science and Technology Ames, Iowa 50011-1120

College of Family and Consumer Sciences
Department of Textiles and Clothing
140 LeBaron Hall
Telephone: 515-294-2628
515-294-2695

Introduction:

The producers of textile materials need more information on fabric properties that determine consumer preference for textile products. The hand of a fabric is one of the most important factors that influences acceptance of a fabric by consumers. As international trade has been increasing in apparel and other textile products, standardized terminology used to communicate subjective fabric properties is important for quality control among producers in different nations.

The Textiles and Clothing Department at Iowa State University is conducting research on descriptive words used by U. S. and Korean persons when they see and touch fabrics. While your participation in this project is voluntary, we hope that you will complete the study. It is important that you respond to each item of the questionnaire. We expect it will take about 20 minutes to complete the task. No further participation will be asked of you. There are no right or wrong answers.

Your responses will be kept confidential and will not be connected with your name in any way. If you have any questions, please feel free to ask.

We appreciate your taking the time to participate in this project.

Sincerely,

Hyunsik Kim
Graduate Research Assistant

Geitel Winakor
Professor
Textiles & Clothing Department

Sample Response Form -- Subjective Hand

This form is to be used to describe your responses to the handle of the fabric that you will be assessing. For each of the fabric samples you will have a list of adjectives as shown below in sample items. Circle the number that best describes how well you think each adjective describes the hand of the fabric:

If you are **completely certain** that the word **describes** the hand of the fabric, circle **+5.**

If you are **not completely certain,** use a number between **+4** and **+1** to indicate how certain you are that the word **describes** the hand of the fabric.

If you are **uncertain** that the word **describes** the hand of the fabric, circle **0.**

If you are **completely certain** that the word **does not describe** the hand of the fabric, circle **-5.**

If you are **not completely certain,** use a number between **-4** and **-1** to indicate how certain you are that the word **does not describe** the hand of the fabric.

Please respond to every statement. Feel free to use any number from +5 to -5.

Sample items:

	Very certain I agree (A)				Uncertain (U)					Very certain I disagree (D)	
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
1. rough	(A) +5	+4	+3	+2	+1	(U) 0	-1	-2	-3	-4	(D) -5
2. fluffy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. thin	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. compact	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

Now continue to the next fabric.

Fabric _____

	Very certain I agree (A)					Uncertain (U)					Very certain I disagree (D)
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
	(A)					(U)					(D)
1. heavy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. smooth	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. stiff	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. absorbent	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
5. even	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
6. expensive	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
7. shiny	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
8. soft	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
9. flexible	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
10. cool	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
11. loose	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
12. flowing	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
13. strong	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
14. fuzzy	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
15. harsh	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
16 sheer	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
17. durable	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
18. thick	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
19. I would choose this fabric for a shirt for myself.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
20. I would choose this fabric for a shirt for a male.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

Background Questionnaire

Your answers to the following questions about yourself will help us interpret the results of the study. For each question, please circle the number that best describes you.

1. What is your sex?

   1. Female
   2. Male

2. What is your age?

   1. 17 or under
   2. 18-21
   3. 22 or older

3. Are you currently married?

   1. No
   2. Yes

4. Which is your year in school?

   1. Freshman
   2. Sophomore
   3. Junior
   4. Senior
   5. Special student
   6. Graduate student

5. What is your college?

   1. Agriculture
   2. Business Administration
   3. Design
   4. Education
   5. Engineering
   6. Family and Consumer Sciences
   7. Sciences and Humanities
   8. Veterinary Medicine
   9. Graduate

6. What is your major?

   _____

7. What language did you use during elementary school?

   1. English
   2. Other (Please state) _____

Iowa State University of Science and Technology Ames, Iowa 50011-1120

College of Family and Consumer Sciences
Department of Textiles and Clothing
140 LeBaron Hall
Telephone: 515-294-2628
515-294-2695

인사의 말씀:

섬유생산품의 소비자 선호를 알기위하여 섬유업계에서는 직물특성에 관한 정보를 더욱 필요로 하고 있읍니다. 직물의 촉감은 소비자들이 직물을 선택하는데 영향을 주는 가장 중요한 요소중의 하나입니다. 의류산업에 있어서 국제 교류가 활발해짐 따라 주관적인 섬유특성을 표현하는데 사용되어지는 표준화된 용어가 국가들 간의 품질 조절을 위해서 중요해지고 있읍니다.

Iowa State University 의 의류학과에서는 한국인과 미국인 소비자가 직물을 보거나 만지는데 있어서 사용하는 표현언어에 관한 연구를 수행중입니다. 이 연구과제에서 귀하의 참여는 자발적이지만, 저희는 귀하가 이연구에 참여하시기를 바랍니다. 보다 정확한 자료를 위하여 모든 문항에 빠짐없이 응답해 주십시요. 본 설문은 약 20분이 소요되며, 옳거나 그른 대답은 없읍니다.

귀하의 응답은 비밀로 지켜질 것이며, 귀하의 이름은 어떠한 방법으로도 연결되지 않을 것입니다. 만일 질문이 있으면 자유롭게 질문해 주시길 바랍니다.

이번 연구에 귀하의 시간을 할애해 주셔서 대단히 감사합니다.

김 현식
대학원생 연구원

Geitel Winakor
교수
의류학과

응답지 견본 – 주관적 촉감

이 양식은 직물촉감에 대한 귀하의 응답을 위해서 사용될것 입니다. 각각의 직물 견본에따라 아래에 있는 문항을 사용해 주십시요. 귀하가 생각하기에 직물의 촉감을 잘 묘사했다고 생각되는 각각의 형용사의 번호에 동그라미를 해주시기 바랍니다.

만일 그 형용사가 직물의 촉감을 **확실하게** 묘사했다고 생각되시면 +5에 동그라미를 해 주십시요.

만일 **확실하지 못하다고** 생각되시면 +4 에서 +1 까지의 숫자를 사용하여 그 형용사가 얼마만큼 직물의 촉감을 **묘사하고** 있는지를 대답해 주십시요.

만일 그 형용사가 얼마 만큼 직물의 촉감을 묘사하는지 **불확실하시면 0**에 동그라미를 해 주십시요.

만일 그 형용사가 직물의 촉감을 **묘사하지 않고** 있다고 **확신하시면** -5에 동그라미를 해주십시요.

만일 **확실하지 못하다고** 생각되시면 -4에서 -1 까지의 숫자를 사용하여 그 형용사가 얼마만큼 직물의 촉감을 **묘사하지 않고**있는지를 대답해 주십시요.

각 문항에 빠짐없이 대답해 주시고, +5 에서 -5 까지의 어느 숫자나 자유롭게 사용하실수 있읍니다.

	매우 확실히 그러하다					잘 모르겠다				매우 확실히 그러하지 않다	
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
1. 거친	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. 포근한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. 얇은	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. 빽빽한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

다음 섬유를 계속해주세요.

섬유 _____

	매우 확실히 그러하다					잘 모르겠다					매우 확실히 그러하지 않다
	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
1. 무거운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
2. 매끈한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
3. 빳빳한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
4. 흡수성이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
5. 고른	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
6. 값비싸 보이는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
7. 빛이 나는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
8. 부드러운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
9. 유연한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
10. 시원한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
11. 느슨한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
12. 잘 처지는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
13. 강한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
14. 잔털이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
15. 꺼끌꺼끌한	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
16. 비치는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
17. 내구성이 있는	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
18. 두꺼운	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
19. 이 직물은 나의 셔츠를 위한 섬유로 선택할만 하다.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
20. 이 직물은 남성의 셔츠를 위한 섬유로 선택할만 하다.	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5

다음 질문에 관한 귀하의 대답은 이 연구 결과를 해석하는데 도움이 될 것입니다.

1. 귀하의 성별은?

    1. 여자

    2. 남자

2. 귀하의 나이는?

    1. 17 또는 그 이하

    2. 18 - 21

    3. 22 또는 그 이상

3. 귀하는 현재 결혼을 하셨읍니까?

    1. 아니요

    2. 예

4. 귀하의 학년은?

    1. 1학년

    2. 2학년

    3. 3학년

    4. 4학년

    5. 대학원생

5. 귀하의 대학은?

    1. 농과대학

    2. 경영대학

    3. 예술대학

    4. 교육대학

    5. 공과대학

    6. 가정대학

    7. 인문과학대학 & 자연과학대학

    8. 수의과대학

6. 귀하의 전공은? _____

APPENDIX F:

FABRIC SAMPLES FOR THE FINAL DATA COLLECTION

173-186

(Fabric samples not included in microfilmed copy.)

APPENDIX G:

MEANS FOR SEX AND COUNTRY ACROSS THE SEVEN FABRICS

Table G-1. Means for sex and country across the seven fabrics

Item	Sex		Country	
	Males	Females	U. S.	Korea
Heavy	-0.88	-2.06	-1.01	-1.91
Smooth	0.13	0.61	1.25	-0.50
Stiff	-1.20	-1.71	-1.82	-1.10
Absorbent	-0.30	-0.31	-0.28	-0.33
Even	1.15	1.83	1.56	1.42
Expensive	-0.17	0.29	0.26	-0.14
Shiny	-1.20	-2.39	-2.34	-1.25
Soft	1.00	1.29	1.33	0.96
Flexible	2.11	2.15	2.63	1.64
Cool	1.78	1.50	2.18	1.11
Loose	1.26	0.89	1.80	0.36
Flowing	1.21	0.84	1.24	0.81
Strong	0.93	0.62	1.46	0.10
Fuzzy	-2.13	-3.55	-3.28	-2.40
Harsh	-0.42	-1.30	-1.95	0.21
Sheer	0.53	0.08	-0.03	0.63
Durable	1.03	1.08	1.42	0.69
Thick	-0.53	-1.82	-1.22	-1.13
Item 19	-0.69	1.04	0.39	-0.05
Item 20	0.78	-0.39	0.29	0.11

APPENDIX H:

MEANS FOR INTERACTION OF SEX BY FABRIC

Table H-1. Means for interaction of sex by fabric for the seven fabrics

Item	Fabrics							
	A		B		C		D	
	Male	Female	Male	Female	Male	Female	Male	Female
Heavy	3.0	2.8	-0.6	-1.5	-6.3	-7.3	-2.3	-3.9
Smooth	1.2	1.2	-3.2	-2.8	4.3	6.1	-2.2	-1.2
Stiff	-1.3	-1.3	3.5	4.5	-5.5	-7.1	-2.3	-3.7
Absorbent	1.2	0.7	-1.4	0.0	-2.3	-3.0	-1.9	-2.5
Even	2.3	3.7	-1.7	-0.5	3.9	4.0	0.5	0.2
Expensive	-0.8	-0.3	-2.4	-0.9	2.7	3.2	-0.6	-0.4
Shiny	-2.6	-3.5	-2.5	-3.2	2.5	2.0	-0.9	-2.1
Soft	2.0	1.8	-3.6	-4.5	4.5	6.2	-0.1	0.4
Flexible	2.3	1.6	-2.2	-3.2	5.8	6.3	2.9	4.2
Cool	-1.5	-1.7	3.2	3.6	4.3	3.3	2.7	2.2
Loose	-0.1	-1.3	-0.1	-0.5	3.2	3.4	2.4	2.8
Flowing	0.0	-1.2	-1.5	-3.6	4.3	6.1	2.4	3.8
Strong	3.2	3.1	1.5	1.9	-1.1	-2.1	-0.5	-0.8
Fuzzy	-1.5	-2.9	-3.7	-5.3	-4.4	-6.4	-2.6	-4.4
Harsh	-1.0	-2.3	3.0	3.4	-3.7	-5.5	1.2	0.3
Sheer	-3.1	-4.6	2.2	2.1	3.2	3.7	1.0	0.5
Durable	3.0	3.3	1.0	1.6	-0.7	-1.1	0.0	0.4
Thick	3.1	2.7	-0.7	-1.4	-5.3	-6.5	-1.5	-3.7

Table H-1. (continued)

Item	Fabrics					
	E		F		G	
	Male	Female	Male	Female	Male	Female
Heavy	-2.7	-3.8	3.7	2.7	-1.1	-3.4
Smooth	3.6	3.5	-1.9	-2.2	-1.0	-0.3
Stiff	-4.5	-6.2	2.0	2.8	-0.4	-1.0
Absorbent	1.2	-0.2	1.3	2.0	-0.3	0.9
Even	4.0	4.4	0.8	1.8	-1.7	-0.8
Expensive	1.9	1.4	-1.3	-1.3	-0.8	0.3
Shiny	0.1	-1.4	-2.8	-4.8	-2.2	-3.7
Soft	5.3	6.3	-1.7	-2.2	0.5	1.1
Flexible	4.9	5.8	-0.9	-1.4	2.0	1.7
Cool	0.5	-0.2	-0.5	-0.6	3.8	4.0
Loose	2.1	2.0	-0.7	-1.9	1.9	1.7
Flowing	3.1	4.0	-0.8	-3.3	1.0	0.1
Strong	0.5	-0.4	3.0	3.0	-0.1	-0.3
Fuzzy	1.1	1.3	-1.4	-3.1	-2.5	-4.0
Harsh	-3.8	-5.4	1.3	1.6	0.0	-1.3
Sheer	-0.6	-1.2	-2.1	-3.3	3.0	3.4
Durable	0.4	0.1	3.0	3.4	0.4	0.5
Thick	-1.0	-2.9	3.2	2.4	-1.5	-3.3

APPENDIX I:

MEANS FOR INTERACTION OF COUNTRY BY FABRIC

Table I-1. Means for interaction of country by fabric for the seven fabrics

Item	Fabrics							
	A		B		C		D	
	U. S.	Korean	U. S.	Korean	U. S.	Korean	U. S.	Korean
Heavy	2.9	2.9	0.2	-2.2	-6.5	-7.1	-2.4	-3.8
Smooth	2.3	0.1	-2.6	-3.3	5.5	4.9	-1.2	-2.2
Stiff	-2.0	-0.6	4.1	3.9	-6.4	-6.2	-3.6	-2.4
Absorbent	1.7	0.2	-2.1	-0.2	-2.6	-2.7	-1.9	-2.5
Even	2.9	3.1	-1.4	-0.8	4.0	4.0	0.7	0.0
Expensive	0.0	-1.1	-2.2	-1.1	3.3	2.7	-0.2	-0.8
Shiny	-3.2	-2.8	-4.1	-1.7	2.0	2.5	-2.4	-0.7
Soft	2.9	0.9	-4.4	-3.7	4.7	6.0	-0.1	0.5
Flexible	3.1	0.8	-2.1	-3.3	5.8	6.3	3.5	3.6
Cool	0.4	-3.5	1.5	5.2	4.9	2.8	2.3	2.6
Loose	0.0	-1.4	0.2	-0.7	4.2	2.3	2.8	2.4
Flowing	-0.2	-1.0	-2.8	-2.3	5.7	4.7	3.2	3.0
Strong	3.8	2.4	2.2	1.1	-0.9	-2.2	0.2	-1.4
Fuzzy	-3.1	-1.4	-4.7	-4.3	-5.2	-5.6	-3.3	-3.7
Harsh	-2.7	-0.6	2.9	3.5	-5.7	-3.6	-1.1	2.6
Sheer	-3.6	-4.1	0.4	3.9	4.2	2.7	0.2	1.3
Durable	3.7	2.6	2.2	0.4	-1.0	-0.7	0.1	-0.3
Thick	2.2	3.5	-0.8	-1.4	-5.8	-6.0	-2.4	-2.7

Table I-1. (continued)

Item	Fabrics					
	E		F		G	
	U. S.	Korean	U. S.	Korean	U. S.	Korean
Heavy	-3.2	-3.3	3.6	2.9	-1.6	-2.9
Smooth	4.8	2.2	-1.0	-3.1	0.9	-2.2
Stiff	-5.5	-5.2	2.0	2.8	-1.3	0.0
Absorbent	0.5	0.4	1.6	1.8	0.0	0.7
Even	4.3	4.0	1.8	0.8	-1.4	-1.1
Expensive	2.1	1.2	-0.7	-2.0	-0.6	0.1
Shiny	-0.8	-0.5	-4.3	-3.3	-3.6	-2.3
Soft	6.1	5.5	-1.4	-2.5	1.5	0.1
Flexible	5.5	5.2	-0.2	-2.1	2.8	0.9
Cool	2.4	-2.1	0.1	-1.3	3.7	4.1
Loose	3.3	0.8	-0.8	-1.7	2.9	0.8
Flowing	4.0	3.1	-2.0	-2.1	0.9	0.3
Strong	0.7	-0.6	3.5	2.4	0.6	-1.0
Fuzzy	0.4	2.0	-3.3	-1.3	-3.8	-2.6
Harsh	-5.6	-3.6	0.6	2.3	-2.2	0.9
Sheer	0.0	-1.8	-3.4	-2.0	2.0	4.4
Durable	0.2	0.3	3.8	2.7	1.0	-0.1
Thick	-2.2	-1.7	2.7	2.9	-2.4	-2.5

APPENDIX J:

PLOTS FOR MEANS OF INTERACTION OF COUNTRY BY SEX; ADJECTIVES HAVING SIGNIFICANT F-VALUES FOR THE COUNTRY BY SEX INTERACTION

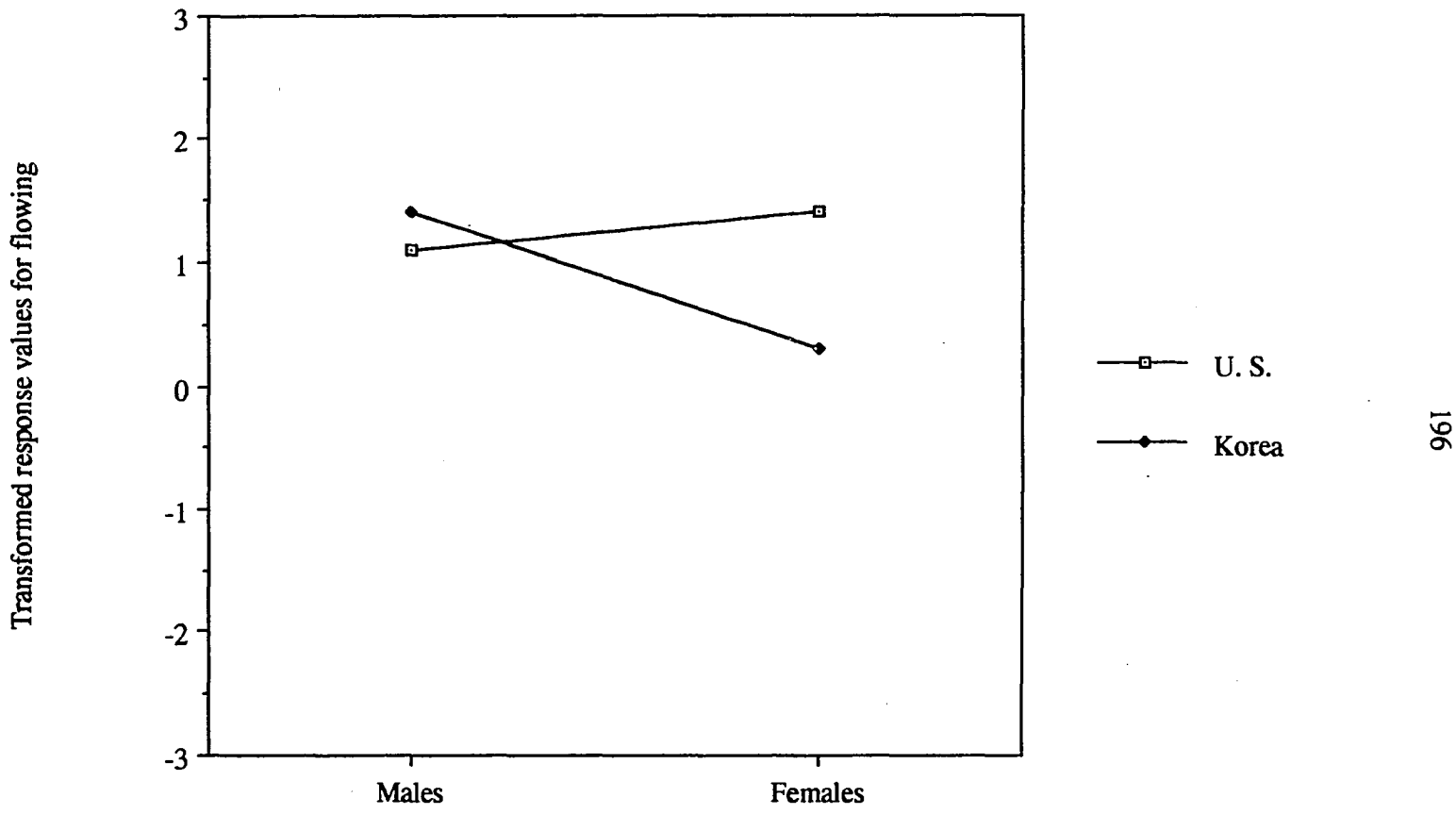

Figure J-1. Plot for means of interaction of country by sex for flowing

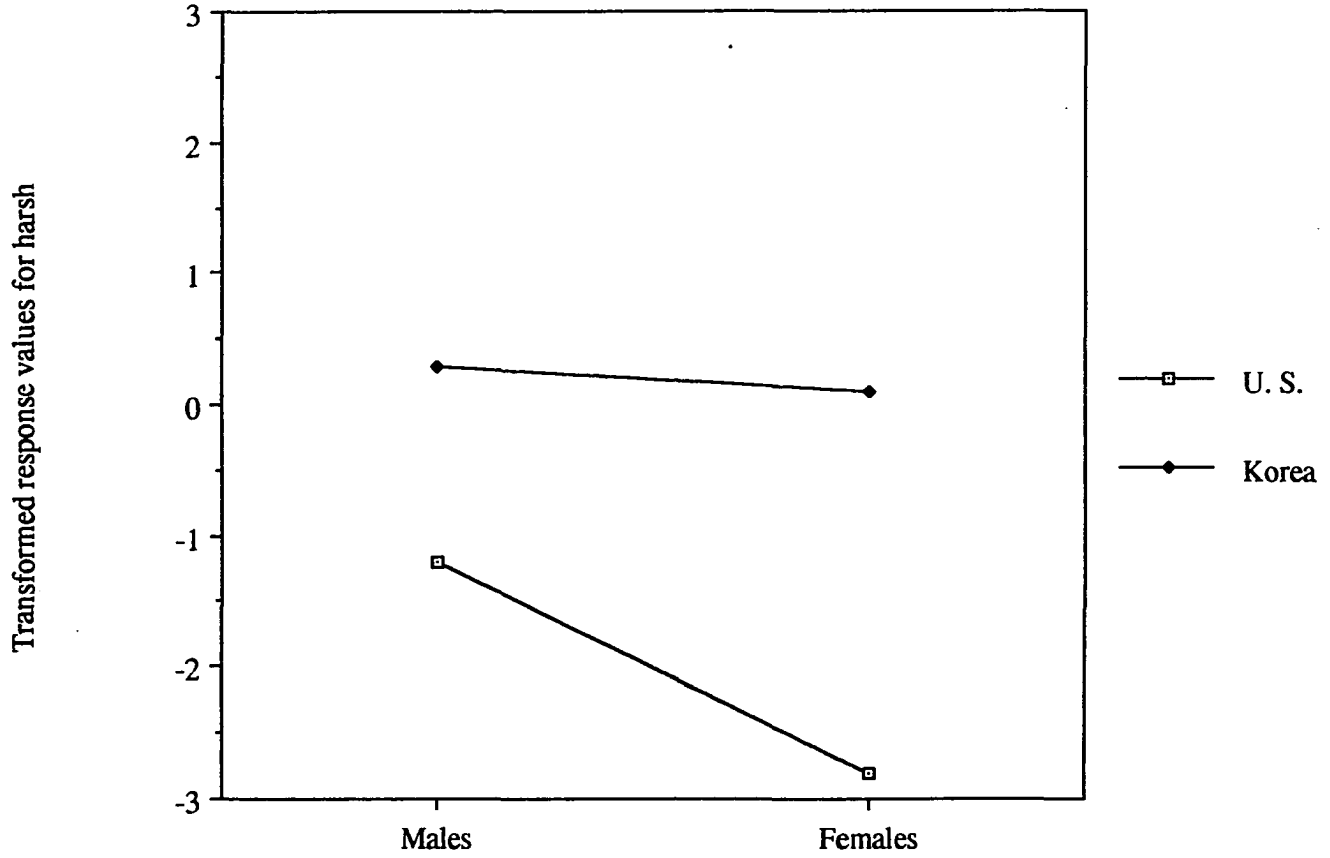

Figure J-2. Plot for means of interaction of country by sex for harsh

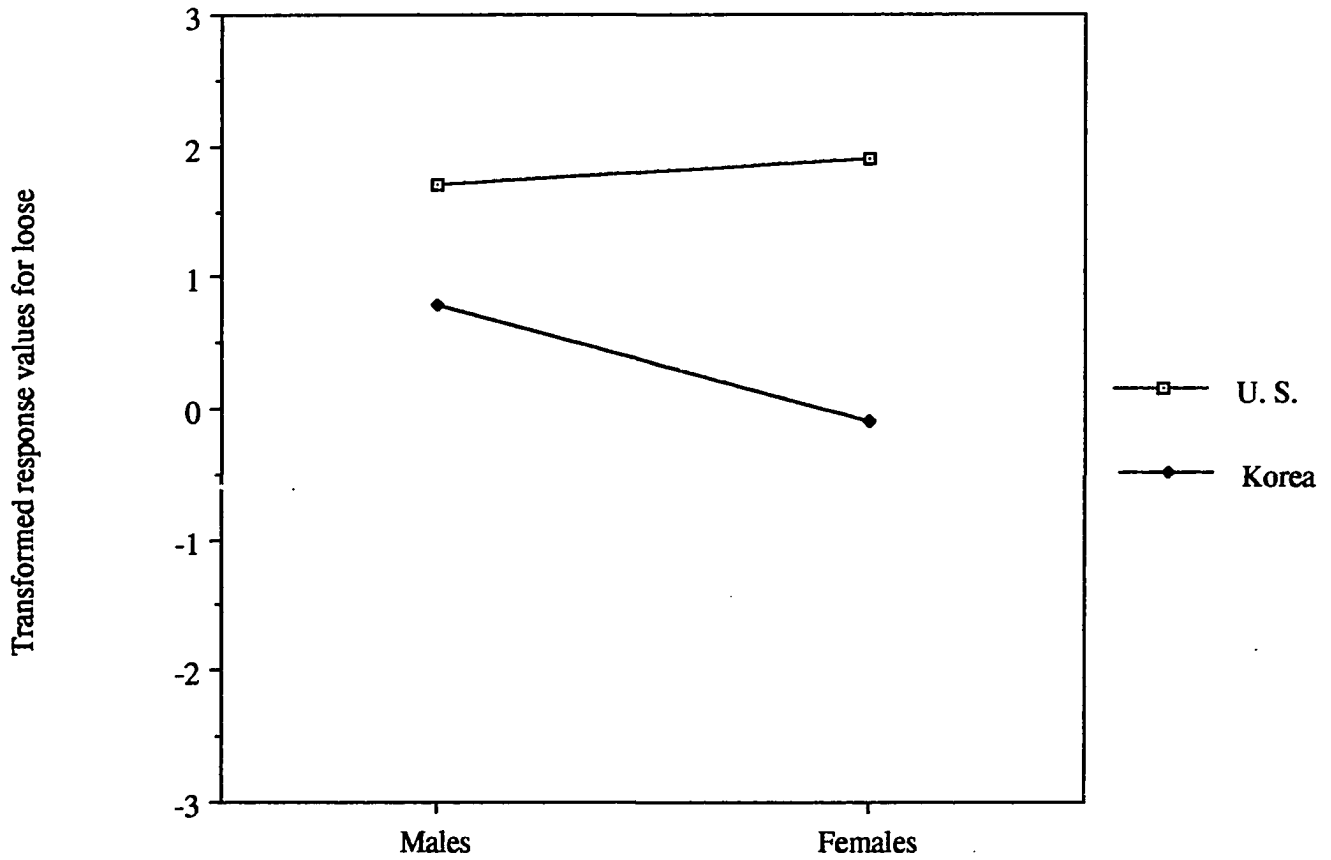

Figure J-3. Plot for means of interaction of country by sex for loose

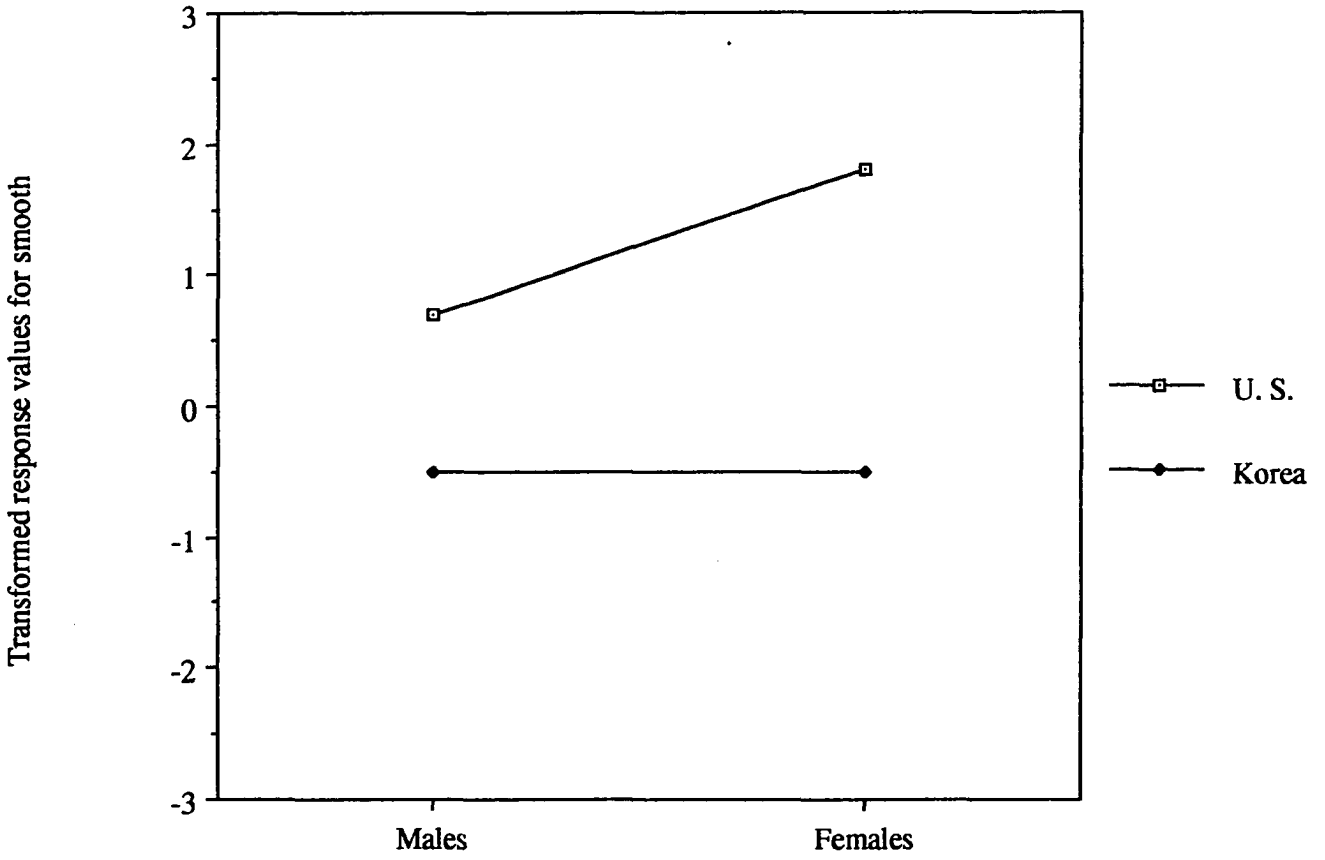

Figure J-4. Plot for means for interaction of country by sex for smooth

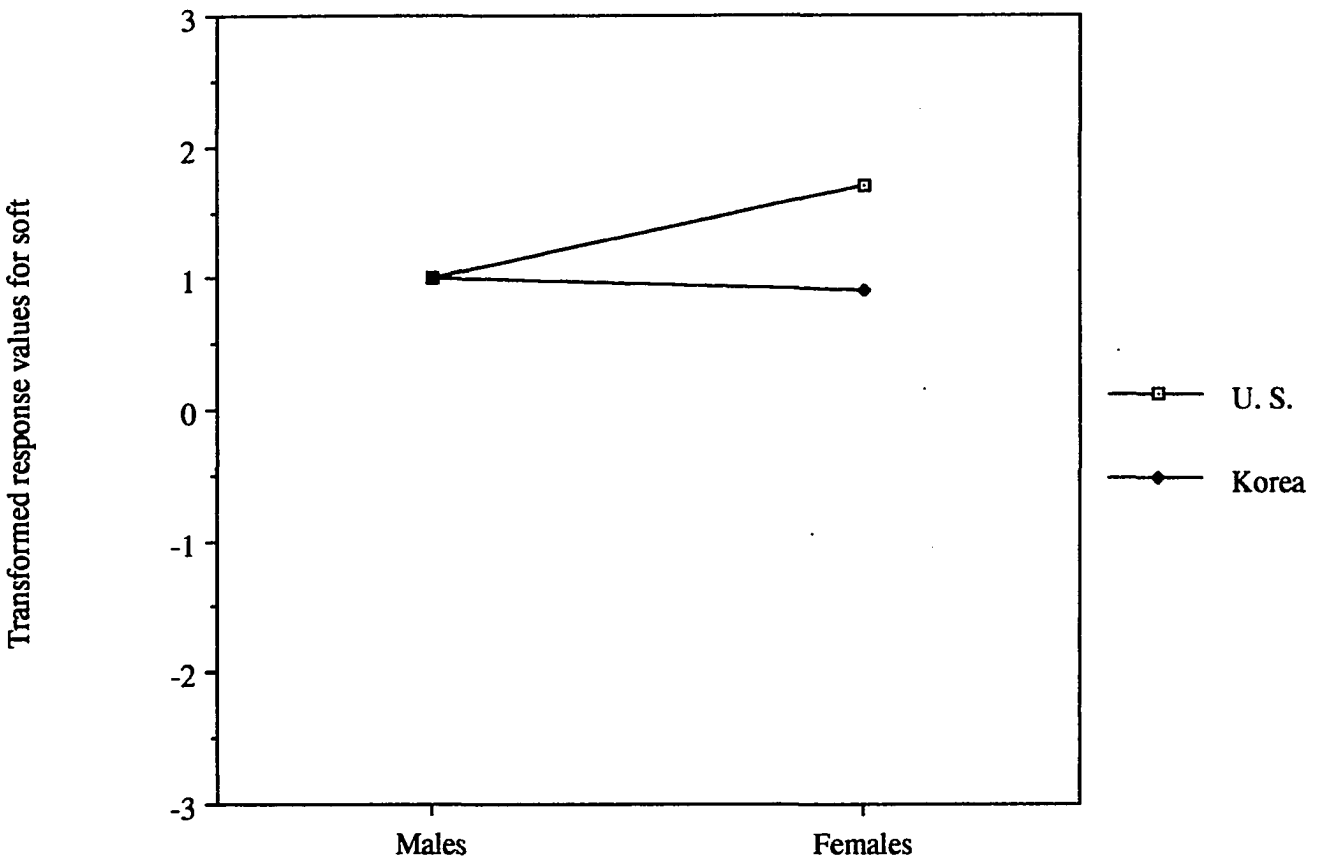

Figure J-5. Plot for means of interaction of country by sex for soft

APPENDIX K:

MEANS FOR INTERACTION OF SEX BY COUNTRY BY FABRIC IN ORDER OF MAGNITUDE OF F-VALUE

Table K-1. Means for interaction of sex by country by fabric for sheer

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-2.8	-4.5	-3.4	-4.7
B	0.4	0.4	4.0	3.8
C	3.4	4.9	3.0	2.5
D	0.1	0.3	1.9	0.7
E	0.7	-0.7	-1.9	-1.8
F	-2.3	-4.4	-1.9	-2.2
G	1.5	2.5	4.6	4.2

Table K-2. Means for interaction of sex by country by fabric for cool

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-0.2	1.0	-2.7	-4.3
B	1.7	1.4	4.7	5.7
C	5.0	4.8	3.6	1.9
D	1.9	2.7	3.4	1.7
E	2.2	2.6	-1.3	-3.0
F	-0.3	0.6	-0.7	-1.8
G	3.2	4.1	4.4	3.8

Table K-3. Means for interaction of sex by country by fabric for stiff

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-1.6	-2.4	-1.1	-0.1
B	2.9	5.3	4.1	3.8
C	-5.6	-7.2	-5.4	-7.1
D	-2.9	-4.3	-1.7	-3.2
E	-4.3	-6.8	-4.7	-5.7
F	1.6	2.4	2.4	3.2
G	-1.2	-1.4	0.5	-0.6

Table K-4. Means for interaction of sex by country by fabric for absorbent

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	1.3	2.2	1.1	-0.7
B	-1.5	-0.9	-1.3	0.9
C	-2.6	-2.6	-2.0	-3.3
D	-1.5	-2.3	-2.2	-2.8
E	0.7	0.4	1.7	-0.8
F	1.2	1.9	1.5	2.1
G	-0.7	0.8	0.2	1.1

Table K-5. Means for interaction of sex by country by fabric for expensive

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-0.3	0.4	-1.2	-0.9
B	-2.4	-2.0	-2.3	0.1
C	2.7	3.9	2.8	2.6
D	-0.6	0.3	-0.5	-1.0
E	1.9	2.3	1.9	0.6
F	-0.8	-0.5	-1.9	-2.2
G	-0.9	-0.3	-0.7	0.9

Table K-6. Means for interaction of sex by country by fabric for heavy

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	3.0	2.8	3.0	2.8
B	0.0	0.3	-1.2	-3.2
C	-5.6	-7.4	-7.0	-7.2
D	-1.5	-3.3	-3.1	-4.5
E	-2.4	-4.0	-2.9	-3.6
F	3.8	3.3	3.7	2.2
G	-0.9	-2.4	-1.3	-4.4

Table K-7. Means for interaction of sex by country by fabric for harsh

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-1.7	-3.7	-0.3	-0.9
B	2.6	3.2	3.4	3.6
C	-4.4	-7.0	-3.1	-4.0
D	0.3	-2.5	2.1	3.0
E	-4.5	-6.7	-3.1	-4.0
F	0.8	0.5	1.9	2.7
G	-1.2	-3.1	1.3	0.5

Table K-8. Means for interaction of sex by country by fabric for smooth

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	1.9	2.7	0.5	-0.3
B	-3.1	-2.1	-3.2	-3.4
C	4.6	6.4	4.1	5.8
D	-1.7	-0.6	-2.6	-1.8
E	4.7	5.0	2.5	2.0
F	-1.2	-0.8	-2.6	-3.6
G	0.1	1.8	-2.1	-2.3

Table K-9. Means for interaction of sex by country by fabric for even

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	2.2	3.7	2.5	3.7
B	-1.7	-1.2	-1.7	0.2
C	3.9	4.0	3.9	4.0
D	0.9	0.4	0.0	0.0
E	4.1	4.6	3.8	4.2
F	1.4	2.3	0.2	1.4
G	-1.9	-0.9	-1.5	-0.6

Table K-10. Means for interaction of sex by country by fabric for shiny

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-2.5	-4.0	-2.7	-2.9
B	-3.8	-4.3	-1.2	-2.2
C	1.8	2.1	3.2	1.8
D	-1.6	-3.2	-0.2	-1.1
E	0.2	-1.7	0.0	-1.1
F	-3.2	-5.5	-2.5	-4.1
G	-2.7	-4.4	-1.6	-2.9

Table K-11. Means for interaction of sex by country by fabric for soft

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	2.6	3.2	1.5	0.4
B	-4.0	-4.8	-3.2	-4.2
C	3.8	5.7	5.3	6.6
D	-0.5	0.3	0.3	0.6
E	5.5	6.8	5.1	5.8
F	-1.5	-1.3	-1.8	-3.1
G	1.0	2.0	0.0	0.1

Table K-12. Means for interaction of sex by country by fabric for flexible

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	3.1	3.0	1.4	0.2
B	-1.7	-2.5	-2.7	-3.8
C	5.8	5.7	5.7	6.8
D	2.7	4.4	3.1	4.1
E	5.0	6.0	4.8	5.6
F	-0.3	-0.2	-1.6	-2.7
G	2.9	2.8	1.1	0.8

Table K-13. Means for interaction of sex by country by fabric for loose

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	0.5	-0.4	-0.7	-2.1
B	0.2	0.1	-0.3	-1.2
C	4.1	4.4	2.2	2.4
D	2.1	3.5	2.7	2.1
E	3.1	3.6	1.2	0.4
F	-0.5	-1.1	-0.8	-2.6
G	2.5	3.3	1.3	0.2

Table K-14. Means for interaction of sex by country by fabric for flowing

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	0.1	-0.5	-0.1	-1.9
B	-1.9	-3.9	-1.1	-3.4
C	4.5	6.9	4.1	5.4
D	1.7	4.7	3.0	3.0
E	3.3	4.8	2.9	3.2
F	-1.0	-3.0	-0.5	-3.6
G	0.8	0.9	1.3	-0.7

Table K-15. Means for interaction of sex by country by fabric for strong

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	4.0	3.6	2.4	2.5
B	2.3	2.2	0.7	1.6
C	-0.7	-1.2	-1.5	-3.1
D	0.4	0.0	-1.3	-1.6
E	1.0	0.5	0.0	-1.2
F	3.5	3.5	2.4	2.4
G	1.0	0.2	-1.3	-0.8

Table K-16. Means for interaction of sex by country by fabric for fuzzy

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	-2.3	-3.9	-0.8	-1.9
B	-4.0	-5.5	-3.4	-5.2
C	-4.0	-6.5	-4.9	-6.3
D	-1.7	-4.9	-3.4	-3.9
E	0.3	0.5	1.9	2.0
F	-2.4	-4.2	-0.5	-2.1
G	-2.9	-4.7	-2.0	-3.2

Table K-17. Means for interaction of sex by country by fabric for durable

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	3.4	4.0	2.6	2.7
B	2.0	2.5	0.1	0.7
C	-1.1	-1.0	-0.3	-1.2
D	0.4	-0.2	-0.3	-0.3
E	0.2	0.1	0.6	0.0
F	3.6	4.1	2.5	2.8
G	1.2	0.8	-0.4	0.2

Table K-18. Means for interaction of sex by country by fabric for thick

Fabric	U. S.		Korean	
	Male	Female	Male	Female
A	2.5	1.9	3.6	3.3
B	-0.7	-0.8	-0.7	-2.0
C	-5.0	-6.6	-5.6	-6.5
D	-0.9	-4.0	-2.1	-3.4
E	-1.1	-3.2	-0.8	-2.5
F	2.9	2.5	3.5	2.2
G	-1.4	-3.3	-1.6	-3.3

APPENDIX L:

MEANS OF U.S. AND KOREAN MALES AND FEMALES FOR EACH OF SEVEN FABRICS

Table L-1. Means of U. S. and Korean males for each of seven fabrics

Item	Fabric A		Fabric B		Fabric C		Fabric D		Fabric E		Fabric F		Fabric G	
	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea
Heavy	3.0	3.0	0.0	-1.2	-5.6	-7.0	-1.5	-3.1	-2.4	-2.9	3.8	3.7	-0.9	-1.3
Smooth	1.9	0.5	-3.1	-3.2	4.6	4.1	-1.7	-2.6	4.7	2.5	-1.2	-2.6	0.1	-2.1
Stiff	-1.6	-1.1	2.9	4.1	-5.6	-5.4	-2.9	-1.7	-4.3	-4.7	1.6	2.4	-1.2	0.5
Absorbent	1.3	1.1	-1.5	-1.3	-2.6	-2.0	-1.5	-2.2	0.7	1.7	1.2	1.5	-0.7	0.2
Even	2.2	2.5	-1.7	-1.7	3.9	3.9	0.9	0.0	4.1	3.8	1.4	0.2	-1.9	-1.5
Expensive	-0.3	-1.2	-2.4	-2.3	2.7	2.8	-0.6	-0.5	1.9	1.9	-0.8	-1.9	-0.9	-0.7
Shiny	-2.5	-2.7	-3.8	-1.2	1.8	3.2	-1.6	-0.2	0.2	0.0	-3.2	-2.5	-2.7	-1.6
Soft	2.6	1.5	-4.0	-3.2	3.8	5.3	-0.5	0.3	5.5	5.1	-1.5	-1.8	1.0	0.0
Flexible	3.1	1.4	-1.7	-2.7	5.8	5.7	2.7	3.1	5.0	4.8	-0.3	-1.6	2.9	1.1
Cool	-0.2	-2.7	1.7	4.7	5.0	3.6	1.9	3.4	2.2	-1.3	-0.3	-0.7	3.2	4.4
Loose	0.5	-0.7	0.2	-0.3	4.1	2.2	2.1	2.7	3.1	1.2	-0.5	-0.8	2.5	1.3
Flowing	0.1	-0.1	-1.9	-1.1	4.5	4.1	1.7	3.0	3.3	2.9	-1.0	-0.5	0.8	1.3
Strong	4.0	2.4	2.3	0.7	-0.7	-1.5	0.4	-1.3	1.0	0.0	3.5	2.4	1.0	-1.3
Fuzzy	-2.3	-0.8	-4.0	-3.4	-4.0	-4.9	-1.7	-3.4	0.3	1.9	-2.4	-0.5	-2.9	-2.0
Harsh	-1.7	-0.3	2.6	3.4	-4.4	-3.1	0.3	2.1	-4.5	-3.1	0.8	1.9	-1.2	1.3
Sheer	-2.8	-3.4	0.4	4.0	3.4	3.0	0.1	1.9	0.7	-1.9	-2.3	-1.9	1.5	4.6
Durable	3.4	2.6	2.0	0.1	-1.1	-0.3	0.4	-0.3	0.2	0.6	3.6	2.5	1.2	-0.4
Thick	2.5	3.6	-0.7	-0.7	-5.0	-5.6	-0.9	-2.1	-1.1	-0.8	2.9	3.5	-1.4	-1.6
Item 19	2.1	-0.9	-3.5	-0.3	-2.1	-1.9	-3.4	-1.8	0.6	1.2	1.6	-0.1	-1.7	0.3
Item 20	0.7	-1.6	-3.1	0.0	4.5	3.2	0.0	1.2	3.8	2.4	-0.3	-1.3	0.4	1.0

Table L-2. Means of U. S. and Korean females for each of seven fabrics

Item	Fabric A		Fabric B		Fabric C		Fabric D		Fabric E		Fabric F		Fabric G	
	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea	U. S.	Korea
Heavy	2.8	2.8	0.3	-3.1	-7.4	-7.2	-3.3	-4.5	-4.0	-3.6	3.3	2.2	-2.4	-4.4
Smooth	2.7	-0.3	-2.1	-3.4	6.4	5.8	-0.6	-1.8	5.0	2.0	-0.8	-3.6	1.8	-2.3
Stiff	-2.4	-0.1	5.3	3.8	-7.2	-7.1	-4.3	-3.2	-6.8	-5.7	2.4	3.2	-1.4	-0.6
Absorbent	2.2	-0.7	-0.9	0.9	-2.6	-3.3	-2.3	-2.8	0.4	-0.8	1.9	2.1	0.8	1.1
Even	3.7	3.7	-1.2	0.2	4.0	4.0	0.4	0.0	4.6	4.2	2.3	1.4	-0.9	-0.6
Expensive	0.4	-0.9	-2.1	0.1	3.9	2.6	0.3	-1.0	2.3	0.6	-0.5	-2.2	-0.3	0.9
Shiny	-4.0	-2.9	-4.3	-2.2	2.1	1.8	-3.2	-1.1	-1.7	-1.1	-5.5	-4.1	-4.4	-2.9
Soft	3.2	0.4	-4.8	-4.2	5.7	6.6	0.3	0.6	6.8	5.8	-1.3	-3.1	2.0	0.1
Flexible	3.0	0.2	-2.5	-3.8	5.7	6.8	4.4	4.1	6.0	5.6	-0.2	-2.7	2.8	0.8
Cool	1.0	-4.3	1.4	5.7	4.8	1.9	2.7	1.7	2.6	-3.0	0.6	-1.8	4.1	3.8
Loose	-0.4	-2.1	0.1	-1.2	4.4	2.4	3.5	2.1	3.6	0.4	-1.1	-2.6	3.3	0.2
Flowing	-0.5	-1.9	-3.8	-3.4	6.9	5.4	4.7	3.0	4.8	3.2	-3.0	-3.6	0.9	-0.7
Strong	3.6	2.5	2.2	1.6	-1.2	-3.1	0.0	-1.6	0.5	-1.2	3.5	2.4	0.2	-0.8
Fuzzy	-3.9	-1.9	-5.5	-5.2	-6.5	-6.3	-4.9	-3.9	0.5	2.0	-4.2	-2.1	-4.7	-3.2
Harsh	-3.7	-0.9	3.2	3.6	-7.0	-4.0	-2.5	3.0	-6.7	-4.0	0.5	2.7	-3.1	0.5
Sheer	-4.5	-4.7	0.4	3.8	4.9	2.5	0.3	0.7	-0.7	-1.8	-4.4	-2.2	2.5	4.2
Durable	4.0	2.7	2.5	0.7	-1.0	-1.2	-0.2	-0.3	0.2	0.0	4.1	2.8	0.8	0.2
Thick	1.9	3.3	-0.8	-2.0	-6.6	-6.5	-4.0	-3.4	-3.2	-2.5	2.5	2.2	-3.3	-3.3
Item 19	2.3	-0.5	-3.2	1.5	5.6	2.0	0.4	-1.3	4.3	0.0	0.9	-0.2	2.0	1.4
Item 20	3.3	0.5	-2.1	2.3	-1.7	-4.4	-4.9	-3.7	1.0	-2.2	2.9	1.1	-0.4	3.0

Table L-3. Means of U. S. males and females for each of seven fabrics (M:male, F:female)

Item	Fabric A		Fabric B		Fabric C		Fabric D		Fabric E		Fabric F		Fabric G	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Heavy	3.0	2.8	0.0	0.3	-5.6	-7.4	-1.5	-3.3	-2.4	-4.0	3.8	3.3	-0.9	-2.4
Smooth	1.9	2.7	-3.1	-2.1	4.6	6.4	-1.7	-0.6	4.7	5.0	-1.2	-0.8	0.1	1.8
Stiff	-1.6	-2.4	2.9	5.3	-5.6	-7.2	-2.9	-4.3	-4.3	-6.8	1.6	2.4	-1.2	-1.4
Absorbent	1.3	2.2	-1.5	-0.9	-2.6	-2.6	-1.5	-2.3	0.7	0.4	1.2	1.9	-0.7	0.8
Even	2.2	3.7	-1.7	-1.2	3.9	4.0	0.9	0.4	4.1	4.6	1.4	2.3	-1.9	-0.9
Expensive	-0.3	0.4	-2.4	-2.1	2.7	3.9	-0.6	0.3	1.9	2.3	-0.8	-0.5	-0.9	-0.3
Shiny	-2.5	-4.0	-3.8	-4.3	1.8	2.1	-1.6	-3.2	0.2	-1.7	-3.2	-5.5	-2.7	-4.4
Soft	2.6	3.2	-4.0	-4.8	3.8	5.7	-0.5	0.3	5.5	6.8	-1.5	-1.3	1.0	2.0
Flexible	3.1	3.0	-1.7	-2.5	5.8	5.7	2.7	4.4	5.0	6.0	-0.3	-0.2	2.9	2.8
Cool	-0.2	1.0	1.7	1.4	5.0	4.8	1.9	2.7	2.2	2.6	-0.3	0.6	3.2	4.1
Loose	0.5	-0.4	0.2	0.1	4.1	4.4	2.1	3.5	3.1	3.6	-0.5	-1.1	2.5	3.3
Flowing	0.1	-0.5	-1.9	-3.8	4.5	6.9	1.7	4.7	3.3	4.8	-1.0	-3.0	0.8	0.9
Strong	4.0	3.6	2.3	2.2	-0.7	-1.2	0.4	0.0	1.0	0.5	3.5	3.5	1.0	0.2
Fuzzy	-2.3	-3.9	-4.0	-5.5	-4.0	-6.5	-1.7	-4.9	0.3	0.5	-2.4	-4.2	-2.9	-4.7
Harsh	-1.7	-3.7	2.6	3.2	-4.4	-7.0	0.3	-2.5	-4.5	-6.7	0.8	0.5	-1.2	-3.1
Sheer	-2.8	-4.5	0.4	0.4	3.4	4.9	0.1	0.3	0.7	-0.7	-2.3	-4.4	1.5	2.5
Durable	3.4	4.0	2.0	2.5	-1.1	-1.0	0.4	-0.2	0.2	0.2	3.6	4.1	1.2	0.8
Thick	2.5	1.9	-0.7	-0.8	-5.0	-6.6	-0.9	-4.0	-1.1	-3.2	2.9	2.5	-1.4	-3.3
Item 19	2.1	2.3	-3.5	-3.2	-2.1	5.6	-3.4	0.4	0.6	4.3	1.6	0.9	-1.7	2.0
Item 20	0.7	3.3	-3.1	-2.1	4.5	-1.7	0.0	-4.9	3.8	1.0	-0.3	2.9	0.4	-0.4

Table L-4. Means of Korean males and females for each of seven fabrics (M: male, F: female)

Item	Fabric A		Fabric B		Fabric C		Fabric D		Fabric E		Fabric F		Fabric G	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Heavy	3.0	2.8	-1.2	-3.1	-7.0	-7.2	-3.1	-4.5	-2.9	-3.6	3.7	2.2	-1.3	-4.4
Smooth	0.5	-0.3	-3.2	-3.4	4.1	5.8	-2.6	-1.8	2.5	2.0	-2.6	-3.6	-2.1	-2.3
Stiff	-1.1	-0.1	4.1	3.8	-5.4	-7.1	-1.7	-3.2	-4.7	-5.7	2.4	3.2	0.5	-0.6
Absorbent	1.1	-0.7	-1.3	0.9	-2.0	-3.3	-2.2	-2.8	1.7	-0.8	1.5	2.1	0.2	1.1
Even	2.5	3.7	-1.7	0.2	3.9	4.0	0.0	0.0	3.8	4.2	0.2	1.4	-1.5	-0.6
Expensive	-1.2	-0.9	-2.3	0.1	2.8	2.6	-0.5	-1.0	1.9	0.6	-1.9	-2.2	-0.7	0.9
Shiny	-2.7	-2.9	-1.2	-2.2	3.2	1.8	-0.2	-1.1	0.0	-1.1	-2.5	-4.1	-1.6	-2.9
Soft	1.5	0.4	-3.2	-4.2	5.3	6.6	0.3	0.6	5.1	5.8	-1.8	-3.1	0.0	0.1
Flexible	1.4	0.2	-2.7	-3.8	5.7	6.8	3.1	4.1	4.8	5.6	-1.6	-2.7	1.1	0.8
Cool	-2.7	-4.3	4.7	5.7	3.6	1.9	3.4	1.7	-1.3	-3.0	-0.7	-1.8	4.4	3.8
Loose	-0.7	-2.1	-0.3	-1.2	2.2	2.4	2.7	2.1	1.2	0.4	-0.8	-2.6	1.3	0.2
Flowing	-0.1	-1.9	-1.1	-3.4	4.1	5.4	3.0	3.0	2.9	3.2	-0.5	-3.6	1.3	-0.7
Strong	2.4	2.5	0.7	1.6	-1.5	-3.1	-1.3	-1.6	0.0	-1.2	2.4	2.4	-1.3	-0.8
Fuzzy	-0.8	-1.9	-3.4	-5.2	-4.9	-6.3	-3.4	-3.9	1.9	2.0	-0.5	-2.1	-2.0	-3.2
Harsh	-0.3	-0.9	3.4	3.6	-3.1	-4.0	2.1	3.0	-3.1	-4.0	1.9	2.7	1.3	0.5
Sheer	-3.4	-4.7	4.0	3.8	3.0	2.5	1.9	0.7	-1.9	-1.8	-1.9	-2.2	4.6	4.2
Durable	2.6	2.7	0.1	0.7	-0.3	-1.2	-0.3	-0.3	0.6	0.0	2.5	2.8	-0.4	0.2
Thick	3.6	3.3	-0.7	-2.0	-5.6	-6.5	-2.1	-3.4	-0.8	-2.5	3.5	2.2	-1.6	-3.3
Item 19	-0.9	-0.5	-0.3	1.5	-1.9	2.0	-1.8	-1.3	1.2	0.0	-0.1	-0.2	0.3	1.4
Item 20	-1.6	0.5	0.0	2.3	3.2	-4.4	1.2	-3.7	2.4	-2.2	-1.3	1.1	1.0	3.0